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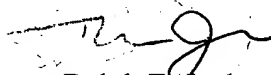
Re: **Application Serial No.:** 09/578,291
Appellants: Jay Paul Drummond, et al.
Filing Date: May 25, 2000
Confirmation No.: 5931
Title: Automated Banking Machine System With
Multiple Entity Interface
Docket No.: D-1077+15

Sir:

Please find enclosed the Brief of Appellants pursuant to 37 C.F.R. § 41.37 for filing in the above-referenced application.

Please charge the fee required with this filing (\$500) and any other fee due to Deposit Account 09-0428 of InterBold.

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AF/3624#
JW



D-1077+15

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In Re Application of:)	
Jay Paul Drummond, et al.)	
)	Art Unit 3624
Serial No.: 09/578,291)	
)	
Confirm. No.: 5931)	
)	
Filed: May 25, 2000)	Patent Examiner
)	Steven R. Wasylchak
For: Automated Banking Machine)	
System With Multiple Entity)	
Interface)	

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF OF APPELLANTS PURSUANT TO 37 C.F.R. § 41.37

Sir:

The Appellants hereby submit their Appeal Brief pursuant to 37 C.F.R. § 41.37
concerning the above-referenced Application.

(i)

REAL PARTY IN INTEREST

The Assignee of all right, title and interest to the above-referenced Application is
Diebold, Incorporated, an Ohio corporation.

(ii) RELATED APPEALS AND INTERFERENCES

This application is a continuation-in-part application of U.S. Application Serial No. 09/193,787 filed November 17, 1998 which is currently on appeal before the Board of Patent Appeals and Interferences. In addition, U.S. Application Serial No. 09/193,787 is a continuation-in-part application of PCT/ US97/21422 filed November 25, 1997 (now U.S. Application Serial No. 09/077,337) which is also currently on appeal before the Board of Patent Appeals and Interferences.

It is believed that these other appeals do not directly pertain to the claimed subject matter. However, it is respectfully requested that the Board make its own determination regarding the pertinence of these other applications. Appellants, Appellants' legal representative, and assignee believe that there are no additional related appeals or interferences pertaining to this matter.

(iii)

STATUS OF CLAIMS

Claims 1-32 are pending in the Application.

Claims rejected: 1-32

Claims allowed: none

Claims confirmed: none

Claims withdrawn: none

Claims objected to: none

Claims canceled: none

Appellants appeal the rejections of claims 1-32. These claim rejections were the only claim rejections present in the Office Action (“Action”) dated September 9, 2004, which was made non-final. Claims 1-27 have been twice rejected.

(iv)

STATUS OF AMENDMENTS

A non-final rejection was made September 9, 2004. No amendments to the claims were requested to be admitted after the non-final rejection.

(v) **SUMMARY OF CLAIMED SUBJECT MATTER**

Concise explanations of exemplary forms of the claimed invention:

With respect to independent claim 1

An exemplary form of the invention is directed to a method. The method comprises the step of determining through operation of an automated banking machine, data corresponding to an entity with which a customer operating the machine has an account. Examples for this method step described in the Specification include the user having indicia corresponding to a system address on a card that is read by a card reader in the banking machine or other input device, which identifies the user or an institution or entity with which the user has an account (Page 9, lines 5-8). Figure 2 shows an example of an automated banking machine such as an ATM (12) which includes a reader such as a card reader/writer mechanism (38).

As described at Page 25, lines 5-15 of the Specification, the address stored on the card may correspond to a uniform resource locator (“URL”) address. This data corresponding to an address may be recorded on track 3 of a magnetic stripe or in other locations in the magnetic stripe data or through encoding other readable indicia on the card. Alternatively, if the customer’s card is a “smart” card which includes semiconductor storage thereon, the URL address associated with the customer may be included as part of the stored data on the integrated circuit chip on the customer’s card.

In another embodiment (Page 25, line 16 to page 26, line 4; page 48, lines 1-15), the URL could be derived from other data on the card by accessing a database in which card data is correlated with address data. For example, a “bank identification number” (BIN) may be read

from a card. The automated banking machine may operate to resolve a network address from the card data by accessing a database which includes BIN data or other entity data correlated with network address data.

In addition to the above described determining step, this exemplary form of the invention comprises the step of providing through an output device on the automated banking machine, at least one output uniquely corresponding to the entity with which the customer has the account. As discussed in the Specification at page 26, lines 1-7, the automated banking machine may use the network address obtained from the card or resolved from card data to access a server operated by the entity with which the user has an account relationship. HTML documents or other types of documents accessed at the address may provide interface screens and transaction flows from the customer's familiar home institution or entity, even though the machine the customer is operating is not controlled by that entity.

Figure 3, shows an example of an HTTP home server (90) and a foreign server (96) which operate to deliver at least one HTML document to a browser (76) of the automated banking machine (12). Figures 19 through 22 graphically represent the operation of an exemplary system when a "foreign" user uses the ATM (12) (Page 48, line 1, page 54, line 21). Examples of output devices through which outputs from the browser are directed include a display device such as a touch screen (30) (Figure 2). However, the automated banking machine may include other types of output devices such as audio speakers (Page 13, lines 16-22).

With respect to independent claim 8

Another exemplary form of the invention is directed to a method which comprises the step of reading card indicia on a card presented by a customer to an automated banking machine (12) (Figure 2). The card indicia includes entity data corresponding to an entity with which the customer has an account (Page 9, lines 5-8; Page 25, line 5 to page 26, line 4). An example of entity data read from a card may include a “bank identification number” (BIN).

This described exemplary form of the invention also comprises the step of resolving network address data with the banking machine responsive to the entity data and data stored in a data store (Page 48, lines 1-15). In addition, this described exemplary form of the invention comprises operating a browser (76) in the banking machine responsive to the resolved network address data, to access at least one network address in a network. The network address accessed corresponds to an address of a server (90, 96) adapted to deliver documents corresponding to the entity with which the customer has the account. Figure 3 shows an example of an HTTP home server (90) and a foreign server (96) which operate to deliver at least one HTML document to a browser (76) of the automated banking machine (12). Figures 19 through 22 graphically represent the operation of an exemplary system when a “foreign” user uses the ATM (12) (Page 48, line 1, page 54, line 21).

As discussed in the Specification at page 26, lines 1-7, the automated banking machine may use the network address obtained from the card or resolved from card data to access a server operated by the entity with which the user has an account relationship. HTML documents or other types of documents accessed at the address may provide interface screens and transaction

flows from the customer's familiar home institution or entity, even though the machine they are operating is not controlled by that entity.

With respect to independent claim 19

Another exemplary form of the invention is directed to an apparatus comprising a plurality of institution servers (20-28) (Figure 1). Each institution server is associated with one of a plurality of financial institutions (Page 13, lines 8-15). Each institution server has at least one unique network address and each institution server is operative to deliver at least one document associated with the respective institution (Page 9, lines 12-18; Page 26, lines 1-7). The apparatus also comprises a network (14) in operative connection with each of the plurality of institution servers. In addition, in this described exemplary form of the invention, the apparatus comprises at least one automated banking machine (12) such as an ATM. As shown in Figure 2, the automated banking machine includes a computer (34) having a browser (76) operating therein, a card reader (38) and an output device (30) in operative connection with the computer (Page 13, line 16 to page 14, line 3). The automated banking machine is operative responsive to reading card indicia on a card read by the card reading device, to cause the browser to connect through the network to a network address of an institution server corresponding to the card indicia (Page 8, line 21 to page 9, line 18). Figures 19 through 22 graphically represent the operation of an exemplary system when a "foreign" user uses the ATM (12) (Page 48, line 1, page 54, line 21).

(vi) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds to be reviewed in this appeal are:

Whether Appellants' claims 1-32 are unpatentable under 35 U.S.C. § 103(a) over Reisman, et al., U.S. Patent No. 6,594,692 ("Reisman") in view of Kolling, et al., U.S. Patent No. 6,385,595 ("Kolling").

(vii)

ARGUMENT

Reisman (U.S. Patent No. 6,595,692)

Reisman is directed to a computer-implemented information transport software module usable with any of multiple electronic information products for mass distribution of electronic information objects to users of a diversity of uncoordinated communications-equipped computer stations (Column 5, lines 1-6). In Reisman, typical communications equipment comprises a modem. However, Reisman also teaches that other communication cards and devices enabling remote communication between computers may be used, such as devices or means permitting communication in a digital rather than analog realm, for example, ISDN or ATM interfaces (Column 5, lines 57-62). Reisman also states that some equivalent networks which may be deployed over telephone network hardware, or interface therewith, include ISDN, ATM and ASDL as well as off-air services such as cellular or CPCD and as well as, cable television networks (Column 35, lines 40-45).

As used in this context, Appellants respectfully submit that the term “ATM” is intended in Reisman to be an acronym for “Asynchronous Transfer Mode,” which is a network architecture capable of very high transmission speeds. Such a definition for ATM is consistent with the other examples of network architectures such as “ISDN” (acronym for “Integrated Services Digital Network”) disclosed along with the term ATM in Reisman. Reisman does not disclose or suggest automated banking machines such as automated teller machines (ATMs).

Appellants respectfully submit that Asynchronous Transfer Mode (acronym “ATM”) disclosed in Reisman is non-analogous art with respect to automated banking machines such as automated teller machines (acronym “ATM”) of the present invention.

Kolling (U.S. Patent No. 6,385,595)

Kolling is directed to an electronic statement presentment system which allows billers and other entities to efficiently and cost effectively deliver electronic statements to respective consumers of their services and products (Column 4, lines 11-16).

The Applicable Legal Standards

Before a claim may be rejected on the basis of obviousness pursuant to 35 U.S.C. § 103, the Patent Office bears the burden of establishing that all the recited features of the claim are known in the prior art. This is known as *prima facie* obviousness. To establish *prima facie* obviousness, it must be shown that all the elements and relationships recited in the claim are known in the prior art. If the Office does not produce a *prima facie* case, then the Appellants are under no obligation to submit evidence of nonobviousness. MPEP § 2142.

The teaching, suggestion, or motivation to combine the features in prior art references must be clearly and particularly identified in such prior art to support a rejection on the basis of obviousness. It is not sufficient to offer a broad range of sources and make conclusory statements. *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

Even if all of the features recited in the claim are known in the prior art, it is still not proper to reject a claim on the basis of obviousness unless there is a specific teaching,

suggestion, or motivation in the prior art to produce the claimed combination. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568, 1 USPQ2d 1593 (Fed. Cir. 1987). *In re Newell*, 891 F.2d 899, 901, 902, 13 USPQ2d 1248, 1250 (Fed. Cir. 1989).

The evidence of record must teach or suggest the recited features. An assertion of basic knowledge and common sense not based on any evidence in the record lacks substantial evidence support. *In re Zurko*, 258 F.3d 1379, 59 USPQ2d 1693 (Fed. Cir. 2001).

A determination of patentability must be based on evidence of record. *In re Lee*, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002).

It is respectfully submitted that the Action from which this appeal is taken does not meet these burdens.

The 35 U.S.C. § 103 (a) Rejections

Rejection under 35 U.S.C. § 103(a) over Reisman in view of Kolling

Claims 1-32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Reisman in view of Kolling. These rejections are respectfully traversed.

Portions of Kolling relied on to support rejections are not prior art

The present application is a continuation-in-part of Application Serial No. 09/193,787 filed November 17, 1998 and claims the benefit of Provisional Application Serial No. 60/149,765 filed August 19, 1999. Further, Application Serial No. 09/193,787 is a continuation-in-part of Application Serial No. 09/077,337 filed as PCT/US97/21422 on November 25, 1997 and claims the benefit of Provisional Application Serial Nos. 60/031,956 filed November 27,

1996; 60/091,887 filed July 7, 1998; 60/095,626 filed August 7, 1998; and 60/098,907 filed September 2, 1998.

Kolling is a continuation of Application Serial No. 08/947,629 (now U.S. Patent No. 5,963,925) which claims the benefit of U.S. Provisional Application Serial No. 60/028,095 filed October 9, 1996. A copy of Kolling's Provisional Application No. 60/028,095 filed October 9, 1996 and Appellants' earliest provisional Application No. 60/031,956 filed November 27, 1996 are attached herewith in the Evidence Appendix.

Although Appellants' earliest provisional application (60/031,956 filed November 27, 1996) was filed later than Kolling's provisional application (60/028,095 filed October 9, 1996), portions of Kolling cited in the Action for supporting the rejection of the claims are not present in Kolling's provisional application. In addition, in the "Response to Arguments and Amendments" section of the Action (Page 2), the Office acknowledges that a detailed one to one mapping of each element of Kolling's provisional to the subsequent Kolling application cannot be made.

Thus, portions of Kolling relied on in the Action to support the rejection of claims 1-32 do not qualify as prior art for purposes of rejecting the claims under 35 U.S.C. § 103(a).

For example, the Action cited Column 15, lines 32-41 of Kolling with respect to steps (a) and (b) of claim 1. Column 15, lines 32-41 of Kolling is a discussion of a field (320) containing a bank identifier (BIN) and other fields shown in Figure 4. Figure 4 of Kolling is directed to a Universal Biller File (UBF). However, Figure 4 of Kolling's Provisional Application 60/028,095 (enclosed herewith) does not teach or suggest a UBF or any of the fields described in Column 15, lines 32-41 of Kolling. Rather, Figure 4 of Kolling's provisional application only shows a block

diagram illustrating a transaction. Further, there is no corresponding figure or discussion anywhere in Kolling's provisional application which corresponds to Column 15, lines 32-41 of Kolling.

In addition, the Action cited Figure 3 and reference numerals 216 and 300 of Figure 3 of Kolling with respect to step (b) of Appellants' claim 8. However, Figure 3 of Kolling's provisional application does not correspond to Figure 3 of Kolling. Further, there is no corresponding figure anywhere in Kolling's provisional application which includes reference numerals 216 and 300.

In contrast, Appellants' earliest provisional application no. 60/031,956 filed November 27, 1996 (enclosed herewith), fully supports Appellants' independent claims. For example, claim 1 recites: a) determining through operation of an automated banking machine, data corresponding to an entity with which a customer operating the machine has an account; and b) providing through an output device on the automated banking machine at least one output uniquely corresponding to the entity with which the customer has the account.

Support for the subject matter of claim 1 is found in Appellants' earliest provisional application, such as at page 7, lines 1-18. Further examples of the subject matter recited in at least Appellants' independent claims is shown at page 18, line 3 to page 22, line 19 of Appellants' earliest provisional application.

Appellants' independent claims are fully supported by Appellants' earliest provisional application while Kolling's provisional does not support the features relied on in the Action to reject the claims. Thus the portions of Kolling relied on in the Action do not qualify as prior art and cannot be used as a basis for a rejection of the claims under 35 U.S.C. § 103.

Claim 1

As discussed previously, the Action has failed to show that all of the portions of Kolling relied upon in the Action to support the rejection of claim 1 qualify as prior art under 35 U.S.C. § 103.

In addition, even if all portions of Kolling qualified as prior art (which they do not), Appellants respectfully submit that Reisman and Kolling still do not disclose or suggest each and every element, relationship and step of the claimed invention arranged in the manner recited in claim 1, as is required to sustain the rejection.

For example, Reisman does not disclose or suggest an automated banking machine. As discussed previously, the term “ATM” used in Reisman is an acronym for “asynchronous transfer mode,” which does not correspond to or suggest to one skilled in the art an automated banking machine such as an automated teller machine (also acronym “ATM”).

Thus the primary reference of Reisman upon which the rejection of claim 1 is based does not disclose or suggest from step (a): “determining through operation of an automated banking machine” as alleged in the Action. Further, the Action admits that Reisman does not disclose the remainder of step (a): “data corresponding to an entity with which a customer operating the machine has an account.” Consequently, Reisman does not disclose or suggest step (a) of claim 1. Further the Reisman does not disclose or suggest step (b) of claim 1 as well.

To overcome the admitted deficiencies of Reisman, the Action asserts that at least portions of step (a) and all of steps (c) and (d) are found in Kolling. Appellants disagree. The Action cites column 15, lines 32-41 and column 34, lines 5-17 of Kolling with respect to claim 1. Column 15, lines 32-41 of Kolling states:

Field 320 contains a bank identifier number (BIN) that identifies the biller's bank. The BIN may be in any suitable format. By way of example, BIN 322 is a six-digit number that uniquely identifies the bank used by the biller. Field 324 contains the biller's bank descriptive data. This descriptive data contains information such as bank name, address, telephone numbers, mailing information, and other descriptive information. For example, field 324 contains name and address information 326 for the Acme Financial Bank.

Column 34, lines 5-17 of Kolling states:

CPU 982 is also coupled to an interface 990 that includes one or more input/output devices such as such as video monitors, track balls, mice, keyboards, microphones, touch sensitive displays, transducer card readers, magnetic or paper tape readers, tablets, styluses, voice or handwriting recognizers, biometrics readers, or other computers. CPU 982 optionally may be coupled to another computer or telecommunications network using a network connection as shown generally at 992. With such network connection, it is contemplated that the CPU might receive information from the network, or might output information to the network in the course of performing the above-described method steps.

However, neither of these portions of Kolling (nor any other portion of Kolling) teaches or suggests all of the elements, relationships or steps recited in claim 1. For example, where do

these portions or any other portion of Kolling disclose “determining through operation of an automated banking machine?” Nowhere in Kolling is it suggested that the CPU 982 or any other component of Kolling corresponds to an automated banking machine.

As discussed in Appellants’ Specification (page 1, lines 7-18), an example of an automated banking machine includes an automated teller machine (“ATM”). ATMs enable customers to carry out banking transactions including transfers of value. Kolling does not disclose or suggest that any portion of the described electronic statement presentment system includes the operation of an automated banking machine or ATM.

Nowhere does Kolling disclose or suggest step (a) of: “determining through operation of an automated banking machine, data corresponding to an entity with which a customer operating the machine has an account.” Column 15, lines 32-41 of Kolling discusses fields or data associated with a Universal Biller File (UBF). However, Kolling does not disclose or suggest that such data is determined through operation of an automated banking machine. Nor does Kolling disclose or suggest such data corresponds to an entity with which a customer operating an automated banking machine has an account. Thus, neither Reisman nor Kolling discloses or suggests step (a) of claim 1.

In addition with respect to step (b), where does Kolling disclose or suggest “providing through an output device on the automated banking machine at least one output uniquely corresponding to the entity with which the customer has the account?” Neither the referenced portions of Kolling nor any other portion of Kolling discloses providing such outputs through an automated banking machine. Further, Reisman does not disclose or suggest this step which is missing from Kolling.

Appellants respectfully submit that the Office has not established *prima facie* obviousness. Reisman and Kolling do not disclose or suggest each and every element, relationship and step of the claimed invention arranged in the manner recited in the claim, as is required to sustain the rejection. Nor has the Office cited any other prior art which shows the features and relationships missing from Reisman and Kolling. Nor is there any prior art teaching, suggestion, or motivation cited for modifying Reisman in view of Kolling so as to produce the claimed invention. Further, it would not have been obvious to one having ordinary skill in the art to have modified Reisman in view of Kolling to have produced the claimed invention. Appellants respectfully submit that the 35 U.S.C. § 103(a) rejection is improper and should be withdrawn.

Claim 2

Claim 2 depends from claim 1. Although Kolling lists input devices capable of being connected to a CPU (Column 34, lines 6-10), Kolling (as well as Reisman) fails to disclose or suggest reading indicia with a reading device in operative connection with an automated banking machine. Thus, the Office has not established *prima facie* obviousness with respect to claim 2.

Claim 3

Claim 3 depends from claim 2. Although Kolling lists “transducer card readers” among numerous input/output devices capable of being connected to a CPU (Column 34, line 8), Kolling (as well as Reisman) fails to disclose or suggest reading indicia on a card with a card

reader in connection with the automated banking machine. Thus, the Office has not established *prima facie* obviousness with respect to claim 3.

Claim 4

Claim 4 depends from claim 1. Although Kolling lists output devices capable of being connected to a CPU (Column 34, lines 6-10), Kolling (as well as Reisman) fails to disclose or suggest providing at least one visual output corresponding to the entity through the output device on an automated banking machine. Thus, the Office has not established *prima facie* obviousness with respect to claim 4.

Claim 5

Claim 5 depends from claim 1. Although Kolling shows a browser in Figure 11, Kolling (as well as Reisman) fails to disclose or suggest processing at least one document through a browser operating in a computer in operative connection with an automated banking machine. Thus, the Office has not established *prima facie* obviousness with respect to claim 5.

Claim 6

Claim 6 depends from claim 5. Neither Reisman nor Kolling discloses or suggests a document processed through a browser which is determined responsive to data determined through operation of an automated banking machine. Thus, the Office has not established *prima facie* obviousness with respect to claim 6.

Claim 7

Claim 7 depends from claim 6. Neither Reisman nor Kolling discloses or suggests accessing a document processed through a browser at a system address, which address is determined responsive to data determined through operation of an automated banking machine. Thus, the Office has not established *prima facie* obviousness with respect to claim 7.

Claim 8

As discussed previously, the Action has failed to show that all of the portions of Kolling relied upon in the Action to support the rejection of claim 8 qualify as prior art under 35 U.S.C. § 103.

In addition, even if all portions of Kolling qualified as prior art (which they do not), Appellants respectfully submit that Reisman and Kolling still do not disclose or suggests each and every element, relationship and step of the claimed invention arranged in the manner recited in claim 8, as is required to sustain the rejection.

For example, Reisman does not disclose or suggest an automated banking machine. As discussed previously, the term “ATM” used in Reisman is an acronym for “asynchronous transfer mode,” which does not correspond to or suggest to one skilled in the art an automated banking machine such as an automated teller machine (also acronym “ATM”).

Thus the primary reference of Reisman upon which the rejection of claim 8 is based does not disclose or suggest an automated banking machine such as an ATM as alleged in the Action. Further, the Action admits that Reisman does not disclose or suggest any portion of step (a) which recites: “reading card indicia on a card presented by a customer to an automated banking

machine, the card indicia including entity data corresponding to an entity with which the customer has an account.” Further Reisman does not disclose or suggest steps (b) and (c) of claim 8 as well.

To overcome the admitted deficiencies of Reisman, the Action asserts that at least portions of step (a) and all of steps (b) and (c) are found in Kolling. Appellants disagree. Neither the portions of Kolling (Column 15, lines 32-41; Column 34, lines 5-17) asserted in the Action of showing step (a) nor any other portion of Kolling, discloses or suggests reading card indicia on a card presented by a customer to an automated banking machine, or that the card indicia includes entity data corresponding to an entity with which the customer has an account.

With respect to step (b) the Action cites Figure 3 of Kolling and reference numerals 216 and 300. Figure 3 of Kolling corresponds to an electronic statement presentment (ESP) System. Reference number 216 of Kolling corresponds to a template library. Reference number 300 of Kolling corresponds to the previously described universal biller file (UBF).

However, neither Figure 3, reference numerals 216 and 300, nor any other portion of Kolling discloses or suggests an automated banking machine. In addition, Kolling does not disclose or suggest, as recited in step (b), resolving network address data with an automated banking machine responsive to entity data and data stored in a data store. Further, Kolling does not disclose or suggest that the entity data used to resolve the network address with an automated banking machine was read from a card presented by a customer to the automated banking machine.

In addition, with respect to step (c), Kolling does not disclose or suggest operating a browser in an automated banking machine. Further, Kolling does not disclose or suggest

operating the browser responsive to network address data resolved by the automated banking machine, responsive to entity data read from a card presented by a customer to the automated banking machine. Further Kolling does not disclose or suggest operating a browser in an automated banking machine to access at least one network address which corresponds to an address of a server adapted to deliver documents corresponding to the entity with which the customer has the account.

Appellants respectfully submit that the Office has not established *prima facie* obviousness. Reisman and Kolling do not disclose or suggest each and every element, relationship and step of the claimed invention arranged in the manner recited in the claim, as is required to sustain the rejection. Nor has the Office cited any other prior art which shows the features and relationships missing from Reisman and Kolling. Nor is there any prior art teaching, suggestion, or motivation cited for modifying Reisman in view of Kolling so as to produce the claimed invention. Further, it would not have been obvious to one having ordinary skill in the art to have modified Reisman in view of Kolling to have produced the claimed invention.

Appellants respectfully submit that the 35 U.S.C. § 103(a) rejection is improper and should be withdrawn.

Claim 9

Claim 9 depends from claim 5. Neither Reisman nor Kolling discloses or suggests processing at least one document corresponding to the entity with which the customer has the account, from the server, and providing at least one output through an output device of an

automated banking machine responsive to the at least one document. Thus, the Office has not established *prima facie* obviousness with respect to claim 9.

Claim 10

Claim 10 depends from claim 9. Neither Reisman nor Kolling discloses or suggests providing at least one visual output through a display of an automated banking machine responsive to a document corresponding to an entity with which the customer has an account. Thus, the Office has not established *prima facie* obviousness with respect to claim 10.

Claim 11

Claim 11 depends from claim 8. The Action lists Figure 2 of Kolling and reference numeral 120 as being relevant to the features recited in claim 11. Figure 2 is directed to an electronic statement presentment environment. Reference numeral 120 corresponds to a coordinating entity. However, neither this portion of Kolling, nor any other portion of Kolling or Reisman, discloses or suggests a first document including an instruction which is operative to cause operation of the transaction function device of an automated banking machine. Further, neither Reisman nor Kolling discloses or suggests processing the first document with a browser in the automated banking machine and operating the transaction function device responsive to the at least one instruction in the first document. Thus, the Office has not established *prima facie* obviousness with respect to claim 11.

Claim 12

Claim 12 depends from claim 8. Although Kolling discloses a system which may include multiple entities such as a biller (104), a biller service provider (106), and a biller financial institution (108) (Figure 2; column 7, lines 30-38), neither Reisman nor Kolling discloses or suggests providing a plurality of servers, one for each of a plurality of entities with which a plurality of users of the automated banking machine have accounts. Further, neither Reisman nor Kolling discloses or suggests repeating steps (a) through (c) for each card presented by a customer at the automated banking machine. In addition, neither reference discloses or suggests that each customer card is operative to cause the browser in the automated banking machine to connect to the server including the at least one document corresponding to the entity with which the customer has their account. Thus, the Office has not established *prima facie* obviousness with respect to claim 12.

Claim 13

Claim 13 depends from claim 12. Neither Reisman nor Kolling discloses or suggests that an automated banking machine includes a display in operative connection with a browser. In addition, neither reference discloses or suggests that the browser is operative responsive to the instructions in the documents to cause to be produced on the display of the automated banking machine the at least one screen uniquely associated with the entity with which the customer has their account. Thus, the Office has not established *prima facie* obviousness with respect to claim 13.

Claim 14

Claim 14 depends from claim 8. The Action asserts that Column 1, lines 30-47 of Kolling is relevant to claim 14. However, this portion of Kolling discusses costs associated with processing a submitted remittance for a bill. Neither this portion of Kolling nor any other portion of Kolling or Reisman discloses or suggests charging the account of the customer a transaction fee for use of the automated banking machine operated by the further entity. In addition, neither reference discloses or suggests sharing between the entity and the further entity at least a portion of the transaction fee. Thus, the Office has not established *prima facie* obviousness with respect to claim 14.

Claim 15

Claim 15 depends from claim 8. With respect to step (d), neither Reisman nor Kolling discloses or suggests accessing with a browser of an automated banking machine a plurality of documents from the server associated with the entity with which the customer has the account.

With respect to step (e) although Kolling discusses advertising biller availability in providing electronic statements to consumers (Column 26, lines 30-50; column 27, lines 12-20), neither Reisman nor Kolling discloses or suggests accessing with a browser operating in the automated banking machine, at least one advertising document from a further server operated by an advertising entity. Further, neither reference discloses or suggests processing the advertising document with a browser to produce advertising content through an output device in operative connection with the automated banking machine. Thus, the Office has not established *prima facie* obviousness with respect to claim 15.

Claim 16

Claim 16 depends from claim 15. Neither Reisman nor Kolling discloses or suggests making a payment by the advertising entity to the further entity, whereby the further entity operating the automated banking machine is compensated for having the advertising entity present advertising content on the banking machine. Thus, the Office has not established *prima facie* obviousness with respect to claim 16.

Claim 17

Claim 17 depends from claim 15. Neither Reisman nor Kolling discloses or suggests executing a step of accessing with a browser operating in the automated banking machine at least one advertising document from a further server operated by an advertising entity during a step of accessing with a browser a plurality of documents from the server associated with the entity with which the customer has the account. Thus, the Office has not established *prima facie* obviousness with respect to claim 17.

Claim 18

Claim 18 depends from claim 15. Neither Reisman nor Kolling discloses or suggests accessing at least one document with a first browser operating in an automated banking machine, and accessing at least one document with a second browser operating in the automated banking machine. Thus, the Office has not established *prima facie* obviousness with respect to claim 18.

Claim 19

As discussed previously the Action has failed to show that all of the portions of Kolling relied upon in the Action to support the rejection of claim 19 qualify as prior art under 35 U.S.C. § 103.

In addition, even if all portions of Kolling qualified as prior art (which they do not), Appellants respectfully submit that Reisman and Kolling still do not disclose or suggests each and every element, relationship and step of the claimed invention arranged in the manner recited in claim 19, as is required to sustain the rejection.

For example, Reisman does not disclose or suggest an automated banking machine. As discussed previously, the term “ATM” used in Reisman is an acronym for “asynchronous transfer mode,” which does not correspond to or suggest to one skilled in the art an automated banking machine such as an automated teller machine (also acronym “ATM”).

Thus the primary reference of Reisman upon which the rejection of claim 19 is based does not disclose or suggest an automated banking machine such as an ATM as alleged in the Action. Further the Action admits that Reisman does not disclose or suggest: a plurality of institution servers, each institution server associated with one of a plurality of financial institutions. In addition, the Action admits that Reisman does not disclose or suggest that each institution server has at least one unique network address and each institution server is operative to deliver at least one document associated with the respective institution. Further the Action does not show where Reisman discloses or suggests any other element or relationship recited in claim 19.

To overcome the admitted deficiencies of Reisman, the Action asserts that Kolling discloses these features which are missing from Reisman. Appellants disagree. As discussed previously, Kolling does not disclose or suggest an automated banking machine. Further, Kolling does not disclose or suggest an automated banking machine which includes a computer having a browser operating therein. In addition, Kolling does not disclose or suggest an automated banking machine that is operative responsive to reading card indicia on a card read by the card reading device of the machine to cause the browser to connect through a network to a network address of an institution server corresponding to the card indicia.

Appellants respectfully submit that the Office has not established *prima facie* obviousness. Reisman and Kolling do not disclose or suggest each and every element, relationship and step of the claimed invention arranged in the manner recited in the claim, as is required to sustain the rejection. Nor has the Office cited any other prior art which shows the features and relationships missing from Reisman and Kolling. Nor is there any prior art teaching, suggestion, or motivation cited for modifying Reisman in view of Kolling so as to produce the claimed invention. Further, it would not have been obvious to one having ordinary skill in the art to have modified Reisman in view of Kolling to have produced the claimed invention. Appellants respectfully submit that the 35 U.S.C. § 103(a) rejection is improper and should be withdrawn.

Claim 20

Claim 20 depends from claim 19. Neither Reisman nor Kolling discloses or suggests a browser operative to process at least one document from an institution server and to provide an output responsive to the document through an output device on an automated banking machine. Thus, the Office has not established *prima facie* obviousness with respect to claim 20.

Claim 21

Claim 21 depends from claim 19. Neither Reisman nor Kolling discloses or suggests a browser in an automated banking machine is operative to process at least one document from an institution server. In addition neither reference discloses or suggests that the document processed by the browser in the automated banking machine includes at least one instruction for enabling operation of a transaction function device included in the automated banking machine. Further neither reference discloses or suggests that the transaction function device is enabled to operate responsive to the browser processing the document. Thus, the Office has not established *prima facie* obviousness with respect to claim 21.

Claim 22

Claim 22 depends from claim 21. Neither Reisman nor Kolling discloses or suggests a document processed by a browser in an automated banking machine which includes at least one sheet dispenser instruction. In addition, neither reference discloses or suggests a sheet dispenser in an automated banking machine which is enabled to dispense at least one sheet responsive to

the browser processing the document. Thus, the Office has not established *prima facie* obviousness with respect to claim 22.

Claim 23

Claim 23 depends from claim 19. Neither Reisman nor Kolling discloses or suggests an automated banking machine which is operative to resolve a network address responsive to a BIN number included in card indicia read from a card. Thus, the Office has not established *prima facie* obviousness with respect to claim 23.

Claim 24

Claim 24 depends from claim 19. Neither Reisman nor Kolling discloses or suggests a computer in an automated banking machine which is programmed to operate to cause a browser to access an advertising document from an advertising server. In addition, neither reference discloses or suggests that the computer of the automated banking machine is operative to output advertising content through the output device of the automated banking machine responsive to the advertising document. Thus, the Office has not established *prima facie* obviousness with respect to claim 24.

Claim 25

Claim 25 depends from claim 24. Neither Reisman nor Kolling discloses or suggests a computer in an automated banking machine which is operative to cause a browser to process at least one document from an institution server, which document includes device instructions. In

addition, neither reference discloses or suggests that a computer in the automated banking machine is adapted to enable a transaction function device of the automated banking machine to operate responsive to the device instructions. Further, neither reference discloses or suggests a computer in an automated banking machine which operates to cause advertising content to be output through an output device during operation of the transaction function device. Thus, the Office has not established *prima facie* obviousness with respect to claim 25.

Claim 26

Claim 26 depends from claim 25. Neither Reisman nor Kolling discloses an automated banking machine with a note dispenser. In addition, neither reference discloses or suggests a computer in an automated banking machine which is adapted to enable a note dispenser of the automated banking machine to operate responsive to the device instructions. Further, neither reference discloses or suggests a computer in an automated banking machine which operates to cause advertising content to be output through an output device during operation of the note dispenser. Thus, the Office has not established *prima facie* obviousness with respect to claim 26.

Claim 27

Claim 27 depends from claim 24. Neither Reisman nor Kolling discloses or suggests a computer in an automated banking machine which includes a first browser and a second browser operating therein. Further, neither reference discloses or suggests that the computer in the automated banking machine operates the first browser to access an institution server and the

second browser to access an advertising server. Thus, the Office has not established *prima facie* obviousness with respect to claim 27.

Claim 28

Claim 28 depends from claim 1. Neither Reisman nor Kolling discloses or suggests an automated banking machine which includes a cash dispenser. Thus, the Office has not established *prima facie* obviousness with respect to claim 28.

Claim 29

Claim 29 depends from claim 28. Neither Reisman nor Kolling discloses or suggests dispensing cash through operation of a cash dispenser. Thus, the Office has not established *prima facie* obviousness with respect to claim 29.

Claim 30

Claim 30 depends from claim 8. Neither Reisman nor Kolling discloses or suggests an automated banking machine which includes a cash dispenser. Thus, the Office has not established *prima facie* obviousness with respect to claim 30.

Claim 31

Claim 31 depends from claim 30. Neither Reisman nor Kolling discloses or suggests dispensing cash through operation of a cash dispenser. Thus, the Office has not established *prima facie* obviousness with respect to claim 31.

Claim 32

Claim 32 depends from claim 19. Neither Reisman nor Kolling discloses or suggests an automated banking machine which comprises a cash dispenser. Thus, the Office has not established *prima facie* obviousness with respect to claim 32.

CONCLUSION

Each of Appellants' pending claims specifically recites elements, relationships, and steps that are neither disclosed nor suggested in any of the applied prior art. Furthermore, the applied prior art is devoid of any teaching, suggestion, or motivation for producing the recited invention. For these reasons it is respectfully submitted that all the pending claims are allowable.

Respectfully submitted,



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CLAIMS APPENDIX

1. A method comprising the steps of:
 - a) determining through operation of an automated banking machine, data corresponding to an entity with which a customer operating the machine has an account;
 - b) providing through an output device on the automated banking machine at least one output uniquely corresponding to the entity with which the customer has the account.
2. The method according to claim 1 wherein step (a) includes reading indicia with a reading device in operative connection with the banking machine.
3. The method according to claim 2 wherein step (a) includes reading indicia on a card with a card reader in connection with the automated banking machine.
4. The method according to claim 1 wherein step (b) includes providing at least one visual output corresponding to the entity through the output device.

5. The method according to claim 4 wherein step (b) includes processing at least one document through a browser operating in a computer in operative connection with an automated banking machine.

6. The method according to claim 5 wherein in step (b) the at least one document is determined responsive to the data determined in step (a).

7. The method according to claim 6 and prior to step (b) further comprising the step of:

accessing the at least one document at a system address, wherein the system address is determined responsive to the data determined in step (a).

8. A method comprising the steps of:

- a) reading card indicia on a card presented by a customer to an automated banking machine, the card indicia including entity data corresponding to an entity with which the customer has an account;
- b) resolving network address data with the banking machine responsive to the entity data and data stored in a data store;

- c) operating a browser in the banking machine responsive to the resolved network address data, to access at least one network address in a network, wherein the network address accessed corresponds to an address of a server adapted to deliver documents corresponding to the entity with which the customer has the account.

9. The method according to claim 8 wherein the banking machine includes an output device, and further comprising the steps of processing at least one document corresponding to the entity with which the customer has the account from the server, and providing at least one output through the output device responsive to the at least one document.

10. The method according to claim 9 wherein the output device comprises a display, and wherein in the providing step the output includes a visual output.

11. The method according to claim 8 wherein the automated banking machine includes at least one transaction function device, and wherein at least a first one of the documents includes at least one instruction which is operative to cause operation of the transaction function device, and further comprising the step of processing the first document with the browser and operating the transaction function device responsive to the at least one instruction in the first document.

12. The method according to claim 8 and further comprising the steps of:

d) providing a plurality of servers, one for each of a plurality of entities with which a plurality of users of the automated banking machine have accounts, each server being in operative connection with a network and having a corresponding network address, each server being adapted to deliver at least one document corresponding to the entity with which it is associated;

repeating steps (a) through (c) for each card presented by a customer at the automated banking machine, whereby each customer card is operative to cause the browser to connect to the server including the at least one document corresponding to the entity with which the customer has their account.

13. The method according to claim 12 wherein the automated banking machine includes a display in operative connection with the browser, and wherein the documents include instructions for producing at least one screen uniquely associated with the corresponding entity, and wherein in step (c) the browser is operative responsive to the instructions in the documents to cause to be produced on the display the at least one screen uniquely associated with the entity with which the customer has their account.

14. The method according to claim 8 wherein the automated banking machine is operated by a further entity, and further comprising the steps of:

- d) charging the account of the customer a transaction fee for use of the automated banking machine operated by the further entity;
- e) sharing between the entity and the further entity at least a portion of the transaction fee.

15. The method according to claim 8 and further comprising the step of:

- d) accessing with a browser a plurality of documents from the server associated with the entity with which the customer has the account;
- e) accessing with a browser operating in the automated banking machine at least one advertising document from a further server operated by an advertising entity;
- f) processing the advertising document with a browser to produce advertising content through an output device in operative connection with the automated banking machine.

16. The method according to claim 15 wherein the automated banking machine is operated by a further entity, and further comprising the step of:

g) making a payment by the advertising entity to the further entity, whereby the further entity operating the automated banking machine is compensated for having the advertising entity present advertising content on the banking machine.

17. The method according to claim 15 wherein step (e) is executed during step (d).

18. The method according to claim 15 wherein in step (d) at least one document is accessed with a first browser operating in the banking machine, and wherein in step (e) at least one document is accessed with a second browser operating in the banking machine.

19. An apparatus comprising:

a plurality of institution servers, each institution server associated with one of a plurality of financial institutions, wherein each institution server has at least one unique network address, and wherein each institution server is operative to deliver at least one document associated with the respective institution;

a network in operative connection with each of the plurality of institution servers;

at least one automated banking machine, wherein the banking machine includes a computer having a browser operating therein, a card reader and an output device in operative connection with the computer;

wherein the automated banking machine is operative responsive to reading card indicia on a card read by the card reading device, to cause the browser to connect through the network to a network address of an institution server corresponding to the card indicia.

20. The apparatus according to claim 19 wherein the browser is operative to process at least one document from the institution server and to provide an output responsive to the document through the output device on the banking machine.

21. The apparatus according to claim 19 wherein the browser is operative to process at least one document from the institution server, wherein the banking machine includes at least one transaction function device, and wherein the document includes at least one instruction for enabling operation of the transaction function device, and wherein the transaction function device is enabled to operate responsive to the browser processing the document.

22. The apparatus according to claim 21 wherein the transaction function device includes a sheet dispenser, and wherein the document includes at least one sheet dispenser

instruction, and wherein the sheet dispenser is enabled to dispense at least one sheet responsive to the browser processing the document.

23. The apparatus according to claim 19 wherein the card indicia includes a BIN number, and wherein the automated banking machine is operative to resolve the network address responsive to the BIN number.

24. The apparatus according to claim 19 and further comprising at least one advertising server in operative connection with the network, wherein the advertising server has at least one unique network address, and wherein the advertising server is operative to provide at least one advertising document, and wherein the computer is programmed to operate to cause the browser to access the advertising document from the advertising server, wherein the computer is operative to output advertising content through the output device responsive to the advertising document.

25. The apparatus according to claim 24 wherein the automated banking machine includes at least one transaction function device in operative connection with the computer, and wherein the computer is operative to cause the browser to process at least one document from the institution server, and wherein the document from the institution server includes device instructions, and wherein the computer is adapted to enable the transaction function device to operate responsive to the device instructions, and wherein the computer operates to cause the

advertising content to be output through the output device during operation of the transaction function device.

26. The apparatus according to claim 25 wherein the transaction function device includes a note dispenser, and wherein the advertising content is output during operation of the note dispenser.

27. The apparatus according to claim 24 wherein the computer includes a first browser and a second browser operating therein, and wherein the computer operates the first browser to access the institution server and the second browser to access the advertising server.

28. The method according to claim 1, wherein in (a) the automated banking machine includes a cash dispenser.

29. The method according to claim 28, further comprising:

d) dispensing cash through operation of the cash dispenser.

30. The method according to claim 8, wherein in (a) the automated banking machine includes a cash dispenser.

31. The method according to claim 30, further comprising:

d) dispensing cash through operation of the cash dispenser.

32. The apparatus according to claim 19, wherein the automated banking machine comprises a cash dispenser.

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EVIDENCE APPENDIX

Copy of U.S. Provisional Application Serial No. 60/028,095 filed October 9, 1996.

Copy of U.S. Provisional Application Serial No. 60/031,956 filed November 27, 1996.

(x)

RELATED PROCEEDINGS APPENDIX

(None)



PROVISIONAL APPLICATION FOR U.S. LETTERS PATENT

Title: AUTOMATED BANKING
MACHINE APPARATUS
AND SYSTEM

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TECHNICAL FIELD

This invention relates to automated banking machines. Specifically this invention relates to an automated banking machine apparatus and system that is capable of use in a wide area network, and which provides a user with a familiar interface from their home institution at banking machines operated by other institutions.

BACKGROUND ART

Automated banking machines are well known. A common type of automated banking machine used by consumers is an automated teller machine ("ATM"). ATMs enable customers to carry out banking transactions. Common banking transactions carried out with ATMs include the dispensing of cash, the making of deposits, the transfer of funds between accounts, the payment of bills and account balance inquiries. The type of banking transactions a customer can carry out are determined by capabilities of the particular banking machine and the programming of the institution operating the machine.

Currently ATMs are operated in proprietary communications networks. These networks interconnect ATMs operated by financial institutions and other entities. The interconnection of the networks often enables a user to use a banking machine operated by another institution if the foreign institution's banking machine is interconnected with the network that includes the user's institution. However when the customer operates the foreign institution's machine the customer must operate the machine using the customer interface that has been established by the foreign institution for its banking machines. In addition the user is limited to the transaction options provided by the foreign institution.

A customer may encounter difficulties when using a foreign institution's machine.

Problems may occur because the user is not familiar with the type of machine operated by the foreign institution. Confusion may result because the customer does not know which buttons or other mechanisms to actuate to accomplish the desired transactions. The

5 transaction flow for a customer at a foreign institution machine may be significantly different from machines operated by the user's home institution. This may be particularly a problem when the user is from another country and is not familiar with the type of banking machine or the language of the interface provided by the foreign institution.

10 A foreign institution may also provide different types of transactions than the user is familiar with at their home institution. For example the user's home institution may enable the transfer of funds between accounts through their automated banking machines, to enable the user to maintain funds in higher interest bearing accounts until they are needed. If the foreign institution does not provide this capability, the user will be unable to do this when operating the foreign machine. The inability of a user at a foreign machine to conduct the

15 transactions that they are accustomed to may present problems.

The networks that operate automated teller machines and other types of automated banking machines generally operate proprietary networks to which access is restricted. This is necessary to prevent fraud or tampering with the network or user's accounts. Proprietary networks are also generally used for the transmission of credit card messages and other

20 financial transaction messages. Access to such credit card processing systems is also restricted primarily for purposes of maintaining security.

Communication over wide area networks enables messages to be communicated between distant locations. The best known wide area network is the Internet which can be used to provide communication between computers throughout the world. The Internet is not widely used for financial transaction messages because it is not a secure system. Messages intended for receipt at a particular computer address may be intercepted at other addresses without detection. Because the messages may be intercepted at locations that are distant in the world from the intended recipient, the potential for fraud and corruption is great.

Companies are beginning to provide approaches for more secure transmission of messages on the Internet. Encryption techniques are also being applied to Internet messages. However the openness of the Internet has limited its usefulness for purposes of financial messages, particularly financial messages associated with the operation of automated banking machines.

Thus there exists a need for an automated banking machine and system that can be used in a wide area network such as the Internet while providing a high level of security.

There further exists a need for an automated banking machine and system which provides a user with the familiar interface and transaction options of their home institution when operating foreign institution machines.

DISCLOSURE OF INVENTION

It is an object of the present invention to provide an automated banking machine at which a user may conduct transactions.

It is a further object of the present invention to provide an automated banking machine that may be operated through connection to a wide area network.

It is a further object of the present invention to provide an automated banking machine and system that provides a user with a familiar interface and transaction options of their home institution at machines operated by foreign institutions.

It is a further object of the present invention to provide an automated banking machine that communicates using HTML documents and TCP/IP messages.

It is a further object of the present invention to provide an automated banking machine that enables the connection of the banking machine to a user's home institution through HTML documents and TCP/IP messages generated responsive to indicia on a card input by a user.

It is a further object of the present invention to provide an automated banking machine and system that accomplishes transactions over a wide area network while maintaining a high level of security.

It is a further object of the present invention to provide an automated banking machine and system that controls connection of the banking machine to foreign addresses through a proxy server.

It is a further object of the present invention to provide an automated banking machine that limits the operation of devices in the machine through a local device server.

It is a further object of the present invention to provide an automated banking machine and system that is operable through connection to the Internet.

Further objects of the present invention will be made apparent in the following Best Modes for Carrying Out Invention and the appended Claims.

The foregoing objects are accomplished in a preferred embodiment of the invention by an automated banking machine that includes an output device such as a display screen, and an input device such as a touch screen or a keyboard. The banking machine further includes devices such as a dispenser mechanism for sheets of currency, a printer mechanism, a card reader/writer, a depository mechanism and other physical devices that are used by the machine to accomplish banking transactions.

The banking machine further includes a computer. The computer is in operative connection with the output device and the input device, as well as with the sheet dispenser mechanism, card reader and other physical devices in the banking machine. The computer includes software programs that are executable therein. The software programs include an HTML document handling portion. The HTML document handling portion operates to send and receive HTML documents. The HTML document handling portion is preferably in connection with the output device to display screens including hypertext link indicators. The HTML document handling portion is also preferably in connection with the input device which enables user selection and the generation of response messages from the computer. The HTML document handling portion preferably operates in connection with a JAVA software environment and has the capability of executing instructions in JAVA script transmitted with HTML documents.

The software in the computer further preferably includes a device application portion. The device application portion includes software that is operative to control the sheet

dispenser and other devices. In the preferred form of the invention the device application portion includes a plurality of JAVA applets for operating the devices in the machine.

5 The computer in the automated banking machine further includes a device interfacing software portion. The device interfacing software portion operates to receive messages from the device application portion and to cause the devices to operate through appropriate hardware interfaces. In the preferred form of the automated banking machine, the HTML document handling portion, device application portion and device interfacing software portion each reside on the same computer and communicate at different IP ports.

10 The automated banking machine of the invention preferably communicates using TCP/IP messages in an intranet which includes a plurality of such machines. The intranet is in turn connected to at least one computer which is operated by a home institution. The home institution is the entity that operates the banking machines.

15 The computer of the home institution preferably includes a home HTTP server, a proxy server and a device server. The proxy server communicates through the intranet with the HTML document handling portion of the software in each of the banking machines. The proxy server is also connectable to a wide area network, such as the Internet, to which foreign servers are connected. The device server is operative to pass messages between the device application portion and the device interfacing software portion of the banking machines. The device server includes monitor software which monitors and selectively limits
20 the use and operation of the devices in the banking machine. This provides a level of security.

The automated banking machine and system is operative to place a user in connection with the institution where they have their accounts. This can be either the home institution that operates the banking machine where the user is present, or a foreign institution which is connected to the wide area network. To operate the banking machine a user inputs an address, such as a URL address, through an address input device. The HTML document handling portion operates to connect the banking machine to the server corresponding to that address. This is preferably accomplished by the user having indicia representative of the address on a card that is read by the banking machine.

The HTML document handling portion is responsive to the address on the card to connect through the proxy server to the user's institution. If the user's home institution address corresponds to the home server, the banking machine operates responsive to messages from the home server. If however the user's input address corresponds to an address of a foreign server, the proxy server is operative to communicate through the wide area network with the foreign server at the customer's home institution. If the customer causes the machine to connect a server operated by a foreign institution, the HTML documents sent from the foreign institution correspond to those normally provided by the foreign institution. As a result the customer is familiar with the interface produced by these documents and will be able to more readily operate the banking machine.

The foreign server or home server operate the banking machine by sending HTML documents that include instructions for operating the devices in the banking machine. The instructions are transmitted from the HTML document handling portion to the device application portion of the software, which operates the devices in response to the

instructions. The instructions from the device application portion to the devices in the automated banking machine are passed through the device server of the home institution. This helps to maintain security. In addition, the proxy server includes screening software which limits the foreign servers which may connect to and operate the banking machine.

5 This is referred to as a "fire wall."

BRIEF DESCRIPTION OF DRAWINGS

Figure 1 is a schematic view of a network configuration including the automated banking machine apparatus and system of the present invention.

Figure 2 is a schematic view of a preferred embodiment of an automated banking machine of the present invention.

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Figures 3 through 24 show schematic views of the automated banking machine, an intranet connecting the banking machine to a computer system of a home bank and a wide area network connecting the computer system of the home bank to a foreign bank.

Figures 3 through 18 schematically represent steps in a transaction carried out at the banking machine with the computer system of the home bank.

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Figures 19 through 24 schematically represent steps in a transaction carried out at the banking machine with the computer system of the foreign bank.

BEST MODES FOR CARRYING OUT INVENTION

Referring now to the drawings and particularly to Figure 1, there is shown therein a network configuration schematically indicated 10, which includes the automated banking

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machine apparatus and system of a preferred embodiment of the present invention. Network 10 includes a plurality of automated banking machines 12 which in the preferred embodiment of the invention are ATMs. ATMs 12 are connected to a computer system of a home bank schematically indicated 14. Home bank computer system 14 is the computer system that is operated by the bank or other institution which has primary responsibility for the ATMs 12. Home bank computer system 14 is connected to the ATMs 12 through an intranet 16. Intranet 16 is preferably a local or proprietary network that provides communication between the computer system 14 and the banking machines 12 using messages in the transmission control protocol/internet protocol ("TCP/IP") format.

The messages that are communicated through the intranet 16 are preferably TCP/IP messages and hypertext mark up language ("HTML") documents. In the preferred embodiment of the invention the HTML documents sent through intranet 16 include embedded object oriented programming instructions, preferably in the JAVA® format which has been developed by Sun Microsystems. The messages sent through intranet 16 may be sent in an encrypted or unencrypted form depending on the nature of the system and the security needs of the home bank.

Home bank computer system 14 is also connectable as shown to a wide area network 18. In the preferred embodiment of the invention the wide area network 18 is the Internet. In other embodiments of the invention, other wide area networks may be used. The wide area network preferably communicates messages in TCP/IP between numerous computer systems connected to the wide area network. These foreign computer systems are schematically represented by servers 20, 22, 24, 26 and 28. It should be understood that

servers 20 through 28 may be operated by or connected to other financial institutions throughout the world. Servers 20 through 28 preferably operate by communicating HTML documents.

Figure 2 shows a schematic view of the ATM 12 used in connection with a preferred embodiment of the invention. ATM 12 includes a touch screen 30. Touch screen 30 includes a display screen which serves as an output device for communication with a user of the machine. Touch screen 30, because it is a touch screen, also serves as an input device for receiving input instructions from a user. Touch screen 30 is connected through an interface 32 to a computer 34 which is preferably housed within the machine.

Computer 34 is also in connection with a plurality of devices 36 which are included in ATM 12. Devices 36 include for example, a card reader/writer mechanism 38 and a keyboard 40. Devices 36 further include a sheet dispenser mechanism 42 which is operative to dispense sheets, which in the preferred form of the invention are currency or bank notes. Devices 36 also include a depository 44 for accepting deposits into a secure location in the machine. A receipt printer 46 for providing transaction receipts to customers is also included among devices 36. A journal printer 48 is also included among the devices for keeping a hard copy record of transaction information.

Each of the devices is connected to an internal control bus 50 within the banking machine 12. The control bus 50 outputs the internal messages to the particular devices. Each device has an appropriate hardware interface which enables the particular device to operate in response to the messages transmitted to it on control bus 50. Card reader/writer 38 has a hardware interface schematically shown as 52. Hardware interfaces 54, 56, 58, 60

and 62 are respectively operative to connect keyboard 40, sheet dispenser mechanism 42, depository mechanism 44, receipt printer mechanism 46 and journal printer mechanism 48 to the control bus 50.

Computer 34 has several software programs that are executable therein. In the preferred embodiment of the invention these software programs include a device interfacing software portion generally indicated 64. Device interfacing software portion 64 preferably includes a software device interface 66 that communicates electronic messages with the control bus 50. The device interface software portion 64 also preferably includes a device manager 68. The device manager is preferably operative to manage the various devices 36 and to control their various states so as to be assured that they properly operate in sequence. The device manager is also preferably operable to create device objects in the software so as to enable operation of the devices by the object oriented program 70. Device interfacing software portion 64 also includes the object oriented program portion 70, which in the preferred embodiment is an application written in the JAVA language. Program 70 works in conjunction with the device manager to receive object oriented JAVA messages which cause the devices to operate, and to transmit device operation messages indicative of a manner in which devices are operating and/or are receiving input data.

The device interfacing software portion 64 in the preferred embodiment operates on computer 34 and communicates through a physical TCP/IP connection 72 with the intranet 16. The physical connection may be analog dial-up, serial port, ISDN connection or other suitable connection. In the configuration of the system as shown, device interfacing software portion 64 communicates at the IP address of computer 34 and at an IP port or socket

indicated 74 that is different from the other software applications. In other embodiments of the invention, device interfacing software portion 64 may operate in a different computer than the other software applications of the invention.

It should further be understood that although in the preferred embodiment of the invention the device interfacing portion 64 is software, in other embodiments of the invention all or portions of the instruction steps executed by software portion 64 may be resident in firmware or in other program media in connection with one or more computers, which are operative to communicate with devices 36.

Other software also operates in computer 34. This software includes HTML document handling software which includes a browser, schematically indicated 76. In the preferred embodiment of the invention the HTML document handling software includes a browser provided by Netscape®. However in other embodiments other HTML document handling and communicating software and browser software, such as Hot JAVA® by Sun Microsystems, may be used. Browser 76 communicates in computer 34 at an IP port indicated by 78.

Browser 76 is in operative connection with JAVA environment software 80 which enables computer 34 to run JAVA language programs. JAVA language programs have the advantage that they operate the same on a variety of hardware platforms without modification. This "write once\run anywhere" capability makes the JAVA environment well-suited for the preferred embodiment of the invention. However other embodiments may use different types of software programs.

The JAVA environment software 80 enables computer 34 to execute instructions in JAVA script, schematically indicated 82. The instructions that are executed by the computer in JAVA script are preferably embedded JAVA script commands that are included in the HTML documents which are received through the browser 76. The browser 76 in connection with the JAVA environment software 80 which executes instructions in the embedded JAVA script 82, serve as an HTML document handling software portion for transmitting and receiving HTML documents and TCP/IP messages through the IP port indicated by 78.

Computer 34 also has executable software therein having a device application portion 84. The device application portion 84 contains executable instructions related to operation of the devices 36. In the preferred embodiment of the invention, the device applications portion consists of a plurality of JAVA applets. The applets are also preferably operable to control and keep track of the status of the devices with which they are associated. Certain applets are also preferably operable to configure the browser to communicate messages. Certain applets manage security and authenticate entities that use the ATM.

In the preferred form of the invention, JAVA applets are associated with enabling the card reader mechanism, notifying the browser when a user's card data has been entered, operating the receipt printer mechanism, operating the journal printer mechanism, enabling the customer keyboard and receiving data input through the keyboard, operating the sheet dispenser mechanism, verifying digital signatures, handling encryption of messages, controlling the mix of bills dispensed from multiple sheet dispenser mechanisms, calculating foreign exchange, and ending a transaction and instructing the browser to return to

communication with the home server. Of course, in other embodiments, other applets may be used to carry out various desired functions or to control devices in the machine. The device application portion 84 communicates in the computer 34 at an IP port indicated by 86.

5 In the preferred embodiment of the invention, the device application portion 84 of the software does not communicate its messages directly to the device interfacing software portion 64. As later explained, this provides heightened security. However it should be understood that embodiments of the invention may provide for the device application portion 84 to directly communicate device operation messages to the device program 70. This may be done either internally using TCP/IP, by delivery of messages in a conventional manner
10 through a queue established in the operating system of the computer that is associated with the software that interfaces with the devices, or by direct call to this software.

From the foregoing discussion it will also be appreciated that certain applets in the device application portion 84 may correspond to devices which are not present in all automated teller machines. For example an automated teller machine that operates only as a
15 cash dispenser does not include a depository mechanism like depository 44. To accommodate the situation where a user requests a transaction that is not physically possible with the ATM 12, the device interfacing software portion 64 may be programmed to provide an appropriate response message to indicate that the function is not available.

20 Alternatively, the device interfacing software portion may include a function which checks for the presence or absence of each type of physical device within the ATM. Information indicative of the devices present in the ATM may be included as part of the messages generated by the ATM. For example, information indicative of the devices which

are operative in the ATM may be included as part of the URL addresses to which messages are directed by the ATM. In this way, the URL in the server to which the ATM connects may be configured for providing only HTML documents which correspond to the types of transactions that the ATM is capable of performing.

5 Figure 3 shows the ATM 12 in communication through the intranet 16 with the home bank computer system 14. Computer system 14 includes a proxy server 88. System 14 further includes a home HTTP server 90. Computer system 14 further includes a device server 92. The proxy server, home HTTP server and device server may be included in a single computer as shown, or in other embodiments may be separate computers.

10 The home HTTP server 90 is preferably in electronic communication with a back office computer system, schematically indicated 94. Back office computer system 94 is operative to keep track of debiting or crediting customers' accounts when they conduct transactions at the automated banking machines. In addition back office 94 is also preferably operative to track transactions for purposes of accomplishing settlements with other
15 institutions who are participants in the system and whose customers conduct transactions at the ATMs 12.

As later explained, proxy server 88 is also operative to communicate through the wide area network 18 with foreign servers such as foreign server 96. Foreign server 96 is an example of a server operated by an institution other than the institution which operates
20 computer system 14. It should be understood that while foreign server 96 is indicated as operated by a "foreign" institution, this is not necessarily indicative that the institution is located in another country from the institution that operates computer system 14. However,

it is possible that foreign server 96 could be located in such a foreign country, including a country in which the language spoken is different from that generally used in the country where ATM 12 is located.

The conduct of transactions using the ATM 12 is now explained with reference to
5 Figures 3-24. It should be understood that the following described transaction flows are merely examples of the operation of the apparatus and system, and the apparatus and system may be configured and operated in numerous ways to carry out transactions.

At the start of an exemplary transaction, as schematically represented in Figure 3, the browser 76 communicates through the intranet 16 with the proxy server 88. The
10 communication is established preferably in a manner so that HTML documents intended to attract customers to the ATM 12 are displayed on the touch screen 30. This is referred to as the "attract mode." These HTML documents which produce the screens on the touch screen 30 originate from home HTTP server 90 which is operative to deliver the HTML documents to the proxy server. The home HTTP server sends the messages addressed to the IP port
15 associated with browser 76, so as to cause their display at the proper ATM machine. It should be understood that while in this example, home server 90 is described as communicating with the ATMs through the proxy server 88, the server 90 may in other systems encompassed by the invention communicate directly with the ATMs.

A fundamental advantage of the system is that home HTTP server 90 may deliver
20 documents selectively to the ATMs 12 connected to the intranet 16. These documents may include messages tailored to the particular location in which an ATM 12 is located. Examples of particularly tailored screens may include bilingual messages in certain

neighborhoods or information concerning currency exchange at various ports of entry. The JAVA applets and JAVA script are loaded from a central location providing selective software distribution in the ATMs which may also be used to tailor the ATM to its environment.

5 The touch screen 30 in this exemplary transaction displays a screen which includes an icon which indicates in one or more languages that to commence a transaction a user should touch the screen. If a user touches the screen in the area of the icon an input signal is generated. The input signal is transmitted through the browser 76 to the home address of the home HTTP server 90 to which the ATM 12 is currently in communication. The message
10 generated back to the home HTTP server is represented by the arrows directed from the browser 76 to the intranet 16, from the intranet 16 to the proxy server 88, and from the proxy server to the HTTP server 90 in Figure 3.

 In response to the home HTTP server 90 receiving the message indicating that a customer has touched the icon on the screen, the home server is operative to send a message
15 through the proxy server 88 (or in other embodiments directly) to the browser 76. This message preferably is an HTML document which produces a screen instructing the customer to insert their card into the card reader mechanism 38. The HTML document flow which is represented graphically in Figure 4, preferably also includes embedded JAVA script instructions which operate in the JAVA environment to communicate a message to the JAVA
20 applet responsible for enabling the card reader in the device application portion 84.

 As shown in Figure 5, in response to the embedded JAVA script activating the JAVA applet associated with the enable card reader function, the JAVA applet in the device

application portion 84 communicates with the device server 92. The device server 92 includes a device server program 98 which in the preferred embodiment is a JAVA program that enables communication with the JAVA applets and the device server application 100. The device server 92 further preferably includes a monitor software application 102 which is operative to monitor device operation instructions. The monitor software minimizes the risk of fraud or abuse in a manner later explained.

Returning to the sample transaction, in response to receiving the enable card reader message from the device application portion 84, the device server 92 is operative to generate a message through the intranet 16 to the device interfacing software portion 64 of the ATM 12. This message is directed to the IP port indicated 74 which is where the device interfacing software portion 64 communicates. In response to receiving this message, the software portion 64 is operative to send a message on the control bus 50 which enables card reader mechanism 34.

Continuing with the transaction as shown in Figure 6, the input of the card by the customer to the card reader 34 is operative to cause the card data to be read and the device interfacing program portion 64 to send a message to the device server 92 indicating the card data has been read. This message is transmitted by the device server through the intranet 16 to the device application portion 84. The device application portion then sends a message to the device server requesting the card data. The device server 92 transmits a message requesting the card data from the device interfacing software portion 64 which responds by sending the card data through the intranet to the device server. The device server, if there is

no basis for stopping the transaction, transmits the card data back through the intranet 16 to the device application portion 84.

In the preferred embodiment of the invention, the card input by a user or customer includes indicia which corresponds to an address associated with the user in the network. In the preferred embodiment the indicia corresponds to a uniform resource locator ("URL") address which provides information on the computer where the user information resides, as well as a directory or subdirectory which includes the user information and the name of the resource that includes the user information. The URL address may be encoded on a customer's card. The address may be encoded on track 3 of a magnetic stripe, in other locations within the magnetic stripe data or through encoding other readable indicia on the card. Alternatively, if the customer's card is a "smart" card which includes semiconductor storage thereon, the URL address associated with the customer may be included as part of the stored data on the integrated circuit chip on the customer's card. Alternatively, a URL could be derived from other data on the card by accessing a data base in which address data is correlated with other data read from the card.

Returning to the exemplary transaction, the delivery of the card data from a successfully read card is delivered responsive to the programming of the device application portion 84 to a JAVA applet associated with notifying that the card data has been entered. In response, the JAVA applet operates to generate JAVA script which configures the browser with the URL address from the card. The JAVA applet is also preferably operative to open a record schematically indicated 104 concerning the transaction, which includes the user's URL address, the time and other card data.

As schematically shown in Figure 7, in response to the browser 76 receiving the URL address data, the browser is operative to transmit a message through the intranet 16 to the proxy server 88. For purposes of this example, the URL address associated with the card data is that of a customer associated with the home bank which operates system 14. As a result, the customer's URL address will cause the message to be directed from the proxy server 88 to the home HTTP server 90. Alternatively, in other systems the connection may be made directly with server 90 without the intervening proxy server 88. As previously discussed, the URL address may also include data representative of the devices which are operative in the ATM.

In response to receiving the message, home HTTP server 90 finds the data corresponding to the customer's URL address data in memory and responds back to the web browser at its IP port with an HTML document. This HTML document may include a screen acknowledging the particular customer by name as well as with the name of the banking institution or other entity which operates the home bank computer system 14.

In addition, the HTML document preferably includes embedded JAVA script which has a digital signature or a means to obtain a digital signature associated with the home HTTP server 90. This digital signature is received from the JAVA script 82 and processed in a JAVA applet in the device application portion 84. The JAVA applet for processing the digital signature authenticates it and authorizes operation of the banking machine.

Alternatively or in addition the applet may check the signature against a listing of digital signatures for servers which are authorized to operate the banking machine. After the applet verifies that server 90 has sent a proper digital signature, the transaction will be allowed to

continue. If for some reason a proper digital signature has not been sent, the JAVA applet will stop the transaction and return banking machine 12 back to the condition prior to the start of the transaction by connecting the ATM to the address associated with the attract mode in home server 90.

5 In the example it will be assumed that the digital signature sent by home server 90 is a proper signature, in which case a message is returned from the browser 76 to home server 90 indicating that the transaction may proceed. As shown in Figure 8, in this exemplary transaction the HTTP home server 90 then operates to send an HTML document to the browser 76 which includes a page or screen which instructs the customer to enter their
10 personal identification number or PIN. This HTML document preferably includes embedded JAVA instructions to have the device application portion 84 enable the keyboard 40 of the ATM so the machine may receive the PIN number. Such a message is schematically shown in Figure 8 with the JAVA script 82 signalling the JAVA applet responsible for the keyboard that it has been requested to enable the keyboard. In response the JAVA applet in the device
15 application portion 84 sends a message through the intranet 16 to the device server 92. The device server 92 sends a message back through the intranet to the device interfacing software portion 64 in the ATM. This message causes the device software to enable keyboard 40. The JAVA applet responsible for enabling the keyboard is also preferably operative to update the transaction record 104 to indicate that the PIN was requested.

20 As shown in Figure 9, the PIN entered through the keyboard 40 is transmitted from the device interfacing software portion 64 to the device server 92. The device server 92 returns a message to the responsible JAVA applet in the device application portion. The

JAVA applet then operates to cause the JAVA script to send a message back through the HTML document handling portion and the browser 76 to the HTTP home server 90. This message includes data representative of the PIN input by the customer.

The HTTP server 90 is then operative to either verify the PIN itself or to verify the customer's PIN number and account number by sending it to the back office 94 and waiting for a response. Alternatively, customer PIN verification may be carried out in the ATM through an appropriate applet. This can be done in situations where data on a customer's card, such as an account number, can be correlated to the customer's PIN number through an algorithm. The embedded JAVA script in the HTML messages may include the data which the applet uses to perform this verification function, including certain encryption key data. As shown schematically in Figure 9, the transaction record 104 is also appropriately updated by the applet to indicate the entry of the customer's PIN.

It should be noted that the page or screen which requests the customer to enter their PIN is generated from the home HTTP server 90. This is preferably a screen that is associated with the particular customer's URL address. This will be the interface of the customer's home bank and will be familiar to the customer. Alternatively, the customer address may access what may be essentially the customer's personal "home page" with the institution that operates computer system 14. As such, it is not only something the user is familiar with, but is ideally tailored to the user's particular transaction needs.

The continuation transaction flow for this exemplary transaction by a customer of the institution that operates computer network 14, is schematically shown in Figure 10. The home HTTP server 90 is operative in response to the customer inputting the correct PIN to

send HTML documents to the HTML document handling portion of the software in the computer which operates the ATM. These messages may include screens which prompt the customer to select a transaction. For purposes of this example, it will be assumed that the customer inputs at the touch screen 30 a selection which corresponds to the dispense of cash,
5 which is a common transaction at an automated banking machine.

The selection of the customer through the input device of the touch screen is communicated back through the HTML document handling portion which communicates a message to the home HTTP server 90. Server 90 then responds by sending another HTML document to the banking machine which prompts the customer to select an amount. Again
10 the customer may input a selection on the touch screen which indicates the amount of cash requested by the customer. This input message again passes through the HTML document handling portion and the browser 76 back to the home server 90.

In response to the receipt of amount data from the customer, the home server 90 is preferably operative to communicate electronically with the back office 94 to verify that the
15 customer has the amount requested in their account. This is preferably accomplished through a Common Gateway Interface (CGI) 106 which is in operative connection with the home server 90. For purposes of this transaction it will be assumed that the back office 94 indicates that the money is available in the customer's account and sends a message through the CGI 106 to the home server 90 indicating that it may proceed.

20 As schematically represented in Figure 11, the home server 90 then operates to send a document back to the HTML document handling portion in the ATM software. This message preferably will cause information to be displayed on the screen which advises the

customer that the transaction is being processed. In addition the HTML document preferably includes JAVA script with embedded instructions which are executed and communicated to a JAVA applet associated with the operation of the sheet dispensing mechanism 42.

The message to the JAVA applet in the device application portion 84 of the software

5 results in generation of a TCP/IP message to the device server 92. The message to the

device server 92 to dispense cash is preferably analyzed by the monitor software 102 to

check to see if the message is appropriate. Specifically the monitor software 102 is

preferably operative to assure that the amount of cash being requested does not exceed a

preset amount. It can also optionally check to verify that the amount provided to this

10 customer within a prior period has not exceeded an amount. This may be done by the device

server sending a message to the back office which includes the card data it has previously

received from this customer. This message may pass through server 90 and its associated

CGI, or other connection. Assuming that the dispense instruction is not prevented by a

message from the back office or the monitor software, the device server 92 is operative to

15 send a dispense message to the device interfacing software portion 64 in the ATM. The

software portion 64 is thereafter operative to operate the sheet dispensing mechanism 42 to

dispense the amount of cash requested by the customer.

The monitor software 102 preferably performs additional functions in the device

server. For example, government regulations or good business practice may require limiting

20 the size and amounts of deposits which may be made into an ATM. This may be advisable

to prevent "money laundering" or other suspicious activities. The monitor software

preferably operates to limit the amount of any single deposit to below a set limit. It further

operates by communicating with the home bank back office system 94 to prevent a series of deposits within a preset time from exceeding a certain limit. The monitor software may also work in connection with the proxy server to limit certain transactions that may be carried on at the banking machine responsive to instructions from foreign servers as later discussed.

5 It should be noted that in a preferred embodiment of the invention the JAVA applet which is operative to send the message which causes cash to be dispensed, works in connection with another applet which controls the mix of bills dispensed to a customer. Many automated teller machines have the ability to dispense two or more denominations of currency bills. It is desirable to control the mix of bills dispensed to a customer to suit that
10 which is available in the machine and to avoid running out of one denomination of bills before the other. The bill mix applet is preferably operable to control the bill mix in accordance with the desires of the institution operating the ATM machine as well as is in accordance with the ATM machine's capabilities. Alternatively, a JAVA applet for controlling bill mix may reside in device program 70 in device interfacing software portion
15 64.

As will be appreciated by those skilled in the art, the particular JAVA applets in the machine may be selectively loaded from the home server 90 at machine start up. Because the applets may be selectively delivered to particular machines, they may be tailored specifically to the particular ATMs currency dispensing capabilities.

20 In response to the cash dispenser 42 dispensing the requested amount of cash, device interfacing software program 64 preferably operates to send a dispense operation message confirming the dispense back to the JAVA applet responsible for the dispense in the device

application program 84. As represented in Figure 12, the particular applet is operative to update the transaction record 104 to indicate the dispense of currency to the customer in the particular amount. The embedded JAVA script instructions which were operative to cause the dispense of currency to the customer, also preferably include instructions to send a
5 confirming message back to the home server 90 that the dispense is complete. The receipt of the dispense operation message indicating the cash was dispensed causes the JAVA applet to configure the HTML document handling portion to send a device response message back to the home server. The home server then is preferably operated in accordance with its programming to indicate to the back office 94 that the customer received the amount of funds
10 dispensed. This amount is deducted from the customer's account in the records maintained by the back office system.

Generally during a transaction it is common to ask the customer if they wish to have a receipt for the transaction. This may be done at various times during the transaction flow. In the present example, after the cash has been dispensed the customer operating the machine
15 is sent such a message as reflected in Figure 13. The home server 90 is operative to send an HTML document which includes a screen asking the customer if they would like a receipt. This message is displayed as part of a page on the touch screen 30 responsive to receipt of the message through the browser 76. In response to the customer indicating that they do or do not want a receipt, a message is returned to the home server. Again it should be
20 understood that the screens displayed to the customer are those that the customer is accustomed to from his or her home institution, and may be a part of his or her unique home page.

Assuming that the customer wishes to receive a transaction receipt, the home server 90 operates as shown in Figure 14 to send a document back to the ATM with embedded JAVA script indicating that a transaction receipt is to be printed. These instructions in JAVA script are communicated to the device application portion 84 which sends a TCP/IP message through the intranet to the device server 92. The device server 92 in turn communicates with the device interfacing software portion 64 in the ATM. In response to receiving the message, software portion 64 is operative to cause the printer 46 to print the customer's transaction receipt. The JAVA applet responsible for enabling the printer is also preferably operative to update the transaction record 104.

It should be understood that even if the customer does not wish to have a receipt it is desirable to print a record of the transaction in hard copy through the journal printer 48. This may be accomplished in response to imbedded instructions which are part of the same document from the home server 90 which causes the transaction receipt for the customer to be printed, or may be part of a separate document which indicates that the customer has declined the option to receive a transaction receipt. Alternatively, the journal printer may be actuated responsive to other applets such as the applet which causes the dispense of cash, or in another manner chosen by the operator of the ATM. As will be appreciated from the foregoing description the operation of the preferred embodiment of the ATM is inherently flexible and programmable to meet the needs of the system operator.

As shown in Figure 15 upon completion of the printing of the transaction receipt, the software portion 64 is preferably operative to send a device operation message to the device server 92 which is indicative that the requested device function was carried out successfully.

The device server 92 is operative to send a corresponding device operation message to the device application portion 84, and in the preferred embodiment to the particular JAVA applet responsible for the printing of the receipt. The JAVA applet in turn configures the HTML document handling portion to generate a message back to the home server in the form of a device response message to indicate that the receipt was printed for the customer.

Having received cash and a receipt, the customer is then prompted by an HTML document from the home server 90 to indicate whether they wish to conduct another transaction. A page or screen prompting the customer in this regard is displayed at the touch screen 30. For purposes of this example it will be assumed that the customer does not want another transaction and a message to that effect is returned through the HTML document handling portion back to the home server 90.

As shown schematically in Figure 17 in response to receiving a message that the customer is done, the home server 90 is operative to send a "go home" message to the ATM. This message preferably includes an HTML document thanking the customer, as well as embedded JAVA script which calls the JAVA applet which eventually returns the HTML document handling portion of the ATM back into connection with the URL address on the home server 90 which carries on the messages for the so called "attract mode".

As schematically indicated in Figure 18, the "go home" command applet is operative to configure the browser 76. After the HTML document handling portion is configured by the JAVA applet to return home, the JAVA applet may be configured to deliver to home server 90 information from the transaction record 104 concerning the transaction that was just completed. Because the exemplary transaction was with a customer of the institution that

operates the computer system 14, all the data concerning that transaction should already be recorded in the back office 94. However it will be appreciated that this will not be the case if the transaction was conducted in response to messages from a server operated by a different institution. Thus, the information from the transaction record 104 may be delivered in response to a "go home" command to the home server 90 and through the CGI to the back office system 94 where it can be identified as duplicate information and discarded.

Of course in other embodiments transaction information may be stored in a database for extended periods rather than being returned after each transaction. Alternatively the ATM 12 of the present invention may include applets which are operable to deliver transaction record information to addresses other than that of the home server, if that is desired by the operator of system 14.

The operation of the computer system when a "foreign" user uses the ATM 12 is graphically represented with regard to Figures 19 through 24. A transaction with a foreign user who is not a customer of the institution that operates ATM 12 and computer system 14, will be operated under the control of the home server 90 and will proceed in the manner of the prior example through the point where the customer inputs their card. The customer inputs a card having indicia corresponding to a URL address that does not correspond to the home server 90. The HTML document handling portion is operative to configure a message addressed to a URL address that corresponds to the indicia on the customer's card. This message is delivered to the proxy server 88 which in turn passes the message to the wide area network 18. From the wide area network the message proceeds to the foreign server

corresponding to the customer's URL address. For purposes of this example the foreign server corresponds to server 96 which is connected to the Internet.

In the preferred embodiment of the invention proxy server 88 includes screening software graphically indicated 107. Screening software is preferably operable to check addresses to which messages are being directed by the ATM and to selectively prevent the sending of messages to particular addresses. This serves as a "fire wall" and is desirable for purposes of preventing fraud in the system.

As shown in Figure 20, the foreign server 96 is preferably operable to communicate documents to the ATM 12 back through the wide area network 18. This is preferably done using a secure socket connection ("SSC") so as to minimize the risk of interception of the messages. Of course other techniques, including encryption message techniques may be used to minimize the risk of interception of the messages.

As schematically represented in Figure 20 the response document from foreign server 96 preferably includes embedded JAVA script representative of a digital signature which corresponds to and identifies the foreign server 96. An applet device in application portion 84 in the ATM preferably operates to authorize the digital signature in the manner described in the prior example, and sends a message indicating that the transaction has been authorized. The digital identity of the foreign institution will be stored in the ATM and eventually recorded in the back office 94.

It should be noted that the HTML documents from the foreign server 96 produce the pages or screens of the foreign institution which the foreign customer is accustomed to

seeing. Preferably these pages correspond to the foreign user's "home page" which are tailored specifically to the needs of the particular user.

Figure 21 shows an example of a document coming from the foreign server 96 to the ATM 12. The document from the foreign server may include embedded JAVA script which enables operation of the JAVA applets in the manner previously discussed to operate the devices 36 in the ATM. As shown in Figure 21 the TCP/IP messages to the devices from the JAVA applets pass from the device application portion 84 to the device server 92, and to the device interfacing software portion 64 in the ATM. Device operation messages take a reverse path. As these messages pass through the device server 92, monitor software 102 monitors them to minimize the risk of fraud or abuse.

As indicated in Figure 21, the documents from the foreign server 96 may be operative to display at the touch screen 30 a request for the customer to input their PIN. The embedded JAVA script instructions would, as in the sample transaction previously discussed, include instructions that enable the keyboard 40 to accept the customer's PIN. As in the prior example, a transaction record 104 concerning this transaction would be opened by the device application software portion.

Figure 22 indicates the return of the device operation message and PIN data to the JAVA applet which in turn transmits the data back to the foreign server 96 through the wide area network 18 using the secure socket connection. From this point the transaction proceeds generally as previously described, except that the foreign server 96 sends the HTML documents and receives the TCP/IP messages from the HTML document handling portion of the ATM. The foreign server 96 includes the JAVA application software necessary to

include the embedded JAVA script in the documents that are sent to the ATM to operate the devices 36 in the machine. As the foreign server 96 operates the machine however, the monitor software 102 in the device server 92 is operative to monitor the messages in the manner previously discussed. Such monitoring would for example, operate to prevent the
5 dispense of unduly large amounts of currency out of the machine.

As can also be appreciated from the foregoing disclosure, the foreign server 96 may communicate to the user through the touch screen in a language that is different from that normally used by the customers of the institution that operates the computer system 14. As a result the HTML documents may display requests to dispense currency of a type or in an
10 amount which is not included in the ATM. To accommodate this situation an applet is included in the device application portion 84 to deal with requests for foreign currency. The foreign currency applet causes the ATM to send a message back to its home server for purposes of calculating a closest amount which may be provided to the customer in the available currency in the ATM which corresponds to what the customer requested. As will
15 be appreciated, this applet will be operative to call the particular function address within the home server 90 that is capable of providing this function. When the dispense is made the applet is also operative to indicate to server 96 that the amount dispensed differs somewhat from the amount the customer requested. Of course in other embodiments, other approaches may be used.

20 As represented in Figure 23, when the foreign customer has completed their transactions as indicated through the touch screen 30, the foreign server 96 is operative to send the "go home" message back to the ATM. The receipt of this message is operative in

the manner previously described to cause the device application portion 84 to operate responsive to the embedded JAVA script instructions to configure the HTML document handling portion to cause the browser 76 to reestablish communication with the home server 90.

5 As indicated in Figure 24 the applet in the device application portion 84 which processes the "go home" message is preferably operative to reconnect to the home server 90 as well as to send the transaction record information in record 104. This transaction record information which includes the customer name, the foreign institution name, digital identifier, amount information and all other pertinent transaction data is communicated to
10 server 90 through the CGI 106 to the home bank's back office 94. This information is stored in the back office for later use for purposes of settlement with the foreign bank operating the foreign server 96.

It will be appreciated that the preferred embodiment of the automated banking machine and system of the present invention provides the advantage that when the machine is
15 connected to a wide area network such as the Internet, customers are able to carry out their banking transactions virtually anywhere in the world. Further, despite the broad capabilities of the system, because the machine is monitored locally, both in terms of connection and activity, the risk of fraud is minimized.

While the preferred embodiment of the automated banking machine and system of the
20 present invention is shown with regard to a particular type of machine that is made specifically for connectibility to wide area networks, conventional automated banking machines may also be adapted to include such capability. Specifically the HTML document

handling portion and device application portions may be included with other conventional software which operates within an automated banking machine. This enables such ATMs to operate either in the conventional proprietary network or as part of a wide area network. In addition, automated banking machines may be configured to operate their devices through the device interfacing software portion of the invention or through a different software interface when operating in a conventional network. Such machines may switch to requiring device messages to be passed through a device server when operating under the control of a server within the wide area network to maintain security within the system. In this way a single ATM could operate in proprietary networks in the manner of current ATMs as well as in the network configuration of the system of the invention.

Alternative embodiments of the invention operate to communicate transaction messages used in a proprietary ATM network. This may be accomplished by using a CGI in connection with either the HTML document handling portion of the ATM or the HTTP home server. The CGI operates in connection with a message conversion program to cull the necessary data from the HTML documents and TCP/IP messages and generates the transaction request messages appropriate for the proprietary transaction network. Likewise, the message conversion program and CGI operate to receive function command messages from the proprietary network and convert them to appropriate HTML documents and/or TCP/IP messages for use by the ATM. Because these proprietary network formats are defined and the data necessary to produce and interpret the messages are known, the use of the ATM 12 directly in a conventional proprietary ATM network is achieved.

The ability of ATM 12 to communicate in a proprietary network also enables operation of the ATM in a manner in which the interface is generated by a user's home institution in the manner previously described, but in which transactions are authorized through messages directed through a proprietary ATM network. This achieves the security of using the proprietary network while providing the customer with the advantages of the familiar home bank interface and/or "personal home page" interface.

A further advantage of the system configuration of the preferred embodiment is that it has enhanced flexibility for communicating messages associated with the ATM. The device-manager 68 preferably generates status messages associated with the status of devices 36. These status messages may commonly represent information about conditions which exist at the devices. Such messages may indicate that supplies of paper for printers or currency, are low or are depleted. Other messages may indicate that devices are not functioning properly. Often such messages indicate that the ATM requires servicing.

The device interfacing software portion 64 communicates through the intranet 16 using TCP/IP messages. While the messages associated with transactions previously described are directed to the device server 92, the software portion 64 may be configured to address fault messages to other addresses in the intranet. For example, such fault messages may be directed to a software application which delivers messages to a service provider. Further, fault messages may be selectively directed based on the nature of the fault indicated. For example, fault messages indicative of a need to replenish currency or supplies may be directed to an address in the intranet associated with an entity who has responsibility for replenishing supplies. Alternatively, fault messages which indicate a need for other types of

servicing may be directed to an address associated with an entity who can provide the type of servicing required.

Alternatively, the selective dispatching of fault messages to addresses in the intranet 16 may be accomplished by appropriately configuring device server 92. In addition, either 5 software portion 64 or device server 92 may direct fault messages from the ATMs to a fault handling system such as to a computer operating Event Management System™ software available from Diebold, Incorporated. Such software is operative to resolve the nature of the fault condition and to notify appropriate personnel of the corrective action to be taken.

Thus the new automated banking machine and system of the present invention 10 achieves the above stated objectives, eliminates difficulties encountered in the use of prior devices and systems, solves problems and attains the desirable results described herein.

In the foregoing description certain terms have been used for brevity, clarity and understanding. However no unnecessary limitations are to be implied therefrom because such terms are for descriptive purposes and are intended to be broadly construed. Moreover 15 the descriptions and illustrations herein are by way of examples and the invention is not limited to the details shown and described.

In the following claims any feature described as a means for performing a function shall be construed as encompassing any means capable of performing the recited function and shall not be deemed limited to the particular means shown in the foregoing description or 20 mere equivalents thereof.

Having described the features, discoveries and principles of the invention, the manner in which it is constructed and operated and the advantages and useful results attained; the

new and useful structures, devices, elements, arrangements, parts, combinations, systems, equipment, operations, methods, processes and relationships are set forth in the appended claims.

CLAIMS

We claim:

1. Apparatus comprising:

a banking machine, including:

5 an output device, wherein such output device outputs information to a user;

an input device, wherein a user is enabled to input messages to said machine;

a sheet dispenser mechanism;

10 a computer, wherein said computer is in operative connection with the output device, the input device and the sheet dispenser mechanism;

software executable in said computer, said software including:

an HTML document handling portion in operative connection with the input device and the output device,

wherein said HTML document handling portion is
operative to receive HTML format documents;

a device application portion in operative interfacing
relation with the HTML document handling portion,

wherein said device application portion is in operative
connection with the sheet dispenser, and wherein said
device application portion is operative responsive to the
HTML document handling portion receiving an HTML
format document including a dispense instruction to
cause the sheet dispenser mechanism to dispense at least
one sheet.

2. The apparatus according to claim 1 and further comprising a card reader mechanism
in operative connection with the HTML document handling portion of the software, and
wherein the card reader is operative to accept a card, wherein said card includes indicia
thereon, and wherein said indicia corresponds with a system address associated with the user,
and wherein said HTML document handling portion is operative to cause a message to be
generated to the system address responsive to said card indicia.

3. The apparatus according to claim 2 wherein the system address for the user includes a
URL address.

4. The apparatus according to claim 1 wherein in said banking machine said HTML document handling portion and said device application portion both communicate messages through TCP/IP, and wherein said HTML document handling portion communicates at a first IP port and said device application portion communicates at a second IP port.

5. The apparatus according to claim 4 wherein the software in the banking machine further comprises a device interfacing software portion, and wherein said device interfacing software portion is operative to interface with said sheet dispenser mechanism, wherein said application portion interfaces with said sheet dispenser mechanism through said device interfacing software portion, and wherein said device interfacing software portion communicates at a third IP port.

6. The apparatus according to claim 1 wherein said HTML document handling portion includes a browser.

7. The apparatus according to claim 1 wherein said dispense instruction is an embedded instruction.

8. The apparatus according to claim 1 wherein said dispense instruction is in JAVA script.

9. The apparatus according to claim 1 wherein said device application portion includes a first applet, wherein said first applet is operative to cause operation of said sheet dispenser mechanism.

10. The apparatus according to claim 1 wherein said banking machine further comprises a printer mechanism, wherein said printer mechanism is in operative connection with said computer, and wherein said printer mechanism is operative responsive to the device application portion of the software, and wherein said printer mechanism is operative to print responsive to receipt of a print instruction by said HTML document handling portion.

11. The apparatus according to claim 1 wherein said banking machine further comprises at least one device, said device being one of a printer mechanism, a card reader mechanism or a depository mechanism, and wherein said device is operative responsive to the device application portion of the software, and wherein the device is operative responsive to receipt of a device instruction by the HTML document handling portion.

12. The apparatus according to claim 1 wherein said dispenser mechanism is operative responsive to dispensing said sheets to cause a dispenser operation message to be delivered to the device application portion of the software, and wherein said HTML document handling portion is operative responsive to delivery of the dispenser operation message to output a dispense response message from said HTML document handling portion.

13. The apparatus according to claim 11 wherein the device is operative responsive to its operation to cause a device operation message to be delivered to the device application portion of the software, and wherein the HTML document handling portion is operative responsive to the delivery of the device operation message to output a device response message from the HTML document handling portion.

14. The apparatus according to claim 12 wherein the HTML document including the dispense instruction includes a response instruction, wherein said response instruction is operative to cause the output of the dispense response message responsive to delivery of the dispense operation message to the device application portion of the software.

15. The apparatus according to claim 1 and wherein said banking machine further comprises a plurality of devices, said devices operative responsive to the device application portion of the software, and wherein said device application portion includes at least one applet operative to control at least one of said plurality of devices.

16. The apparatus according to claim 15 and wherein said software further comprises a device interfacing software portion operative to interface with said devices, and wherein said device interfacing software portion includes a device program operative to interface with said one applet.

17. The apparatus according to claim 16 wherein said applet is operative to communicate through a second IP port and the device program is operative to communicate through a third IP port.

18. The apparatus according to claim 1 and further comprising a home HTTP server in operative connection with the HTML document handling portion of the banking machine, and wherein the home HTTP server is operative to send HTML documents to the HTML document handling portion of the software in the banking machine.

19. The apparatus according to claim 18 wherein the home HTTP server is operative to send the dispense instruction to the banking machine.

20. The apparatus according to claim 18 wherein the home HTTP server includes a home address, and wherein the HTML document handling portion of the software is operative to send a message to the home address in response to a user input at said input device.

21. The apparatus according to claim 18 wherein said home HTTP server has a home address, and wherein said banking machine further comprises a card reader mechanism in operative connection with said device application portion of the software, whereby said card reader mechanism is operative to read card indicia on a card input by a user, and wherein said HTML document handling portion is operative to send a message to the home HTTP server responsive to the card indicia corresponding to the home address.

22. The apparatus according to claim 21 wherein said card indicia further corresponds to identifying information associated with a file, wherein said file is associated with the user, and wherein said file is stored in operative connection with the home HTTP server.

23. The apparatus according to claim 22 wherein said card indicia includes a URL address associated with the user.

24. The apparatus according to claim 22 wherein the file includes at least one HTML document associated with the user.

25. The apparatus according to claim 18 and further comprising a proxy server in operative connection with the home HTTP server, wherein the home HTTP server has a home address, and said HTML document handling portion has a machine address, and wherein said proxy server is operative to direct messages from said banking machine to the home HTTP server responsive to said messages including the home address.

26. The apparatus according to claim 25 wherein the proxy server is also in operative connection with a wide area network, and wherein said wide area network includes a foreign server, wherein said foreign server has a foreign address, and wherein said banking machine further includes an address input device in operative connection with the HTML document handling portion, and wherein the HTML document handling portion is operative responsive to input of the foreign address through said address input device to generate a foreign

message addressed to the foreign address, and wherein said proxy server is operative responsive to receipt of the foreign address to pass the foreign message to said wide area network

27. The apparatus according to claim 26 wherein said proxy server includes screening software, wherein said screening software is operative to prevent the sending of the foreign message to at least one selected foreign address.

28. The apparatus according to claim 26 wherein said proxy server is operative responsive to receiving a foreign response message from said foreign address directed to said machine address to pass the message to said HTML document handling portion of the software in said banking machine.

29. The apparatus according to claim 5 and further comprising a device server, wherein said device application portion of said software and said device interfacing software portion communicate through said device server.

30. The apparatus according to claim 29 wherein said device server includes monitor software, wherein said monitor software is operative to limit operation of said sheet dispensing mechanism.

ABSTRACT

An automated banking machine (12) is operative to conduct transactions in response to HTML documents and TCP/IP messages exchanged with a local computer system (14) through an intranet (16), as well as in response to messages exchanged with foreign servers (20, 22, 24, 26, 28, 96) in a wide area network (18). The banking machine includes a computer (34) having an HTML document handling portion (76, 80, 82). The HTML document handling portion is operative to communicate through a proxy server (88), with a home HTTP server (90) in the intranet or the foreign servers in the wide area network. The computer further includes a device application portion (84) which interfaces with the HTML document handling portion and dispatches messages to operate devices (36) in the automated banking machine. The devices include a sheet dispenser mechanism (42) which dispenses currency. The device application portion communicates with a device interfacing software portion (64) in the banking machine through a device server (92) in the intranet. The device server maintains local control over the devices in the banking machine including the sheet dispenser. The banking machine operates to read indicia on the user's card corresponding to a system address. The computer is operative to connect the banking machine to the home or foreign server corresponding to the system address, which connected server operates the banking machine until the completion of transactions by the user.

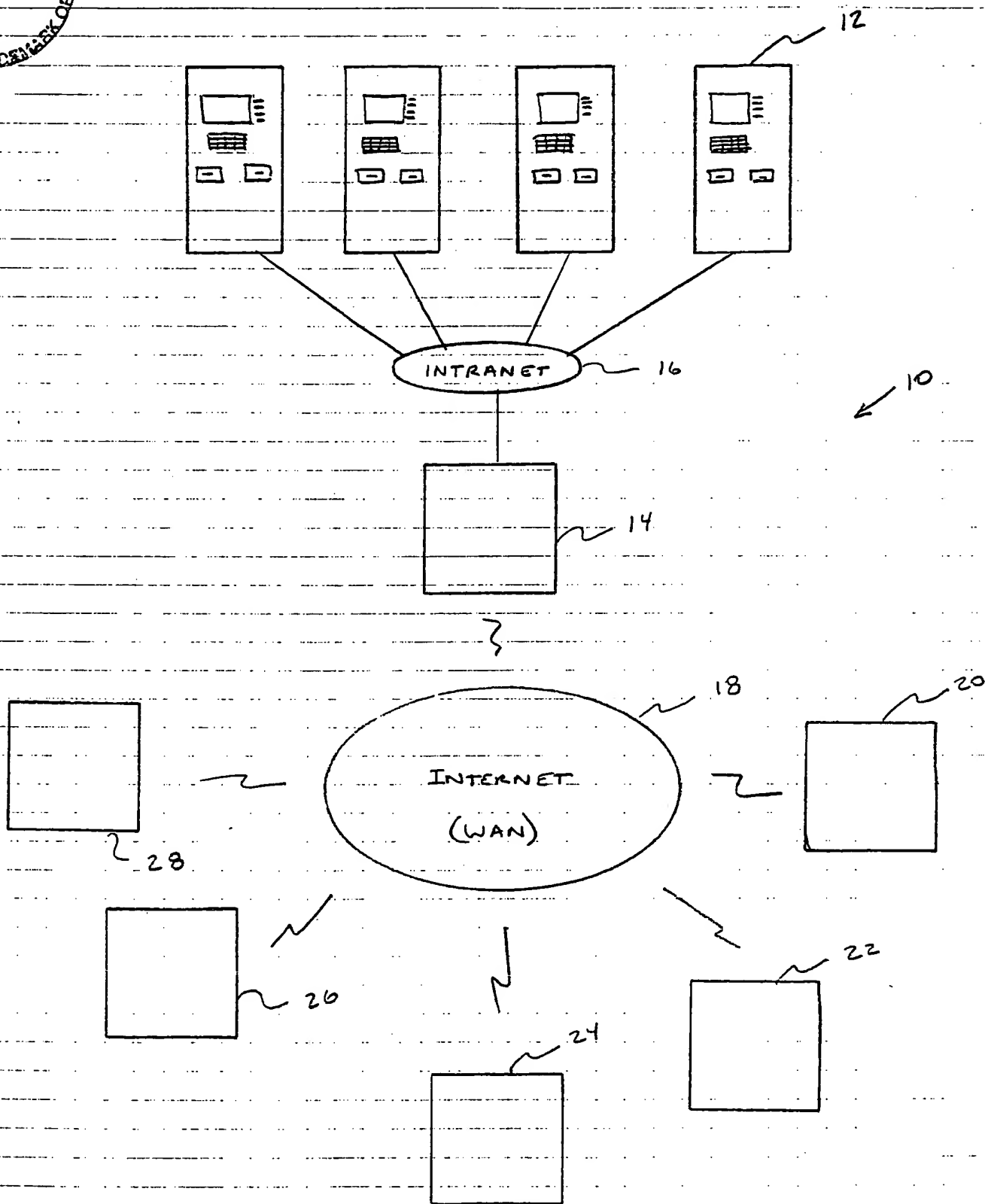
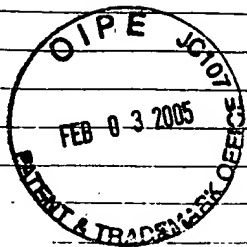


FIG. 1

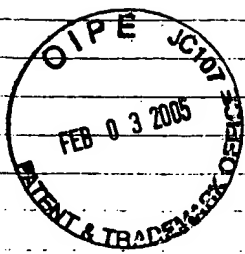
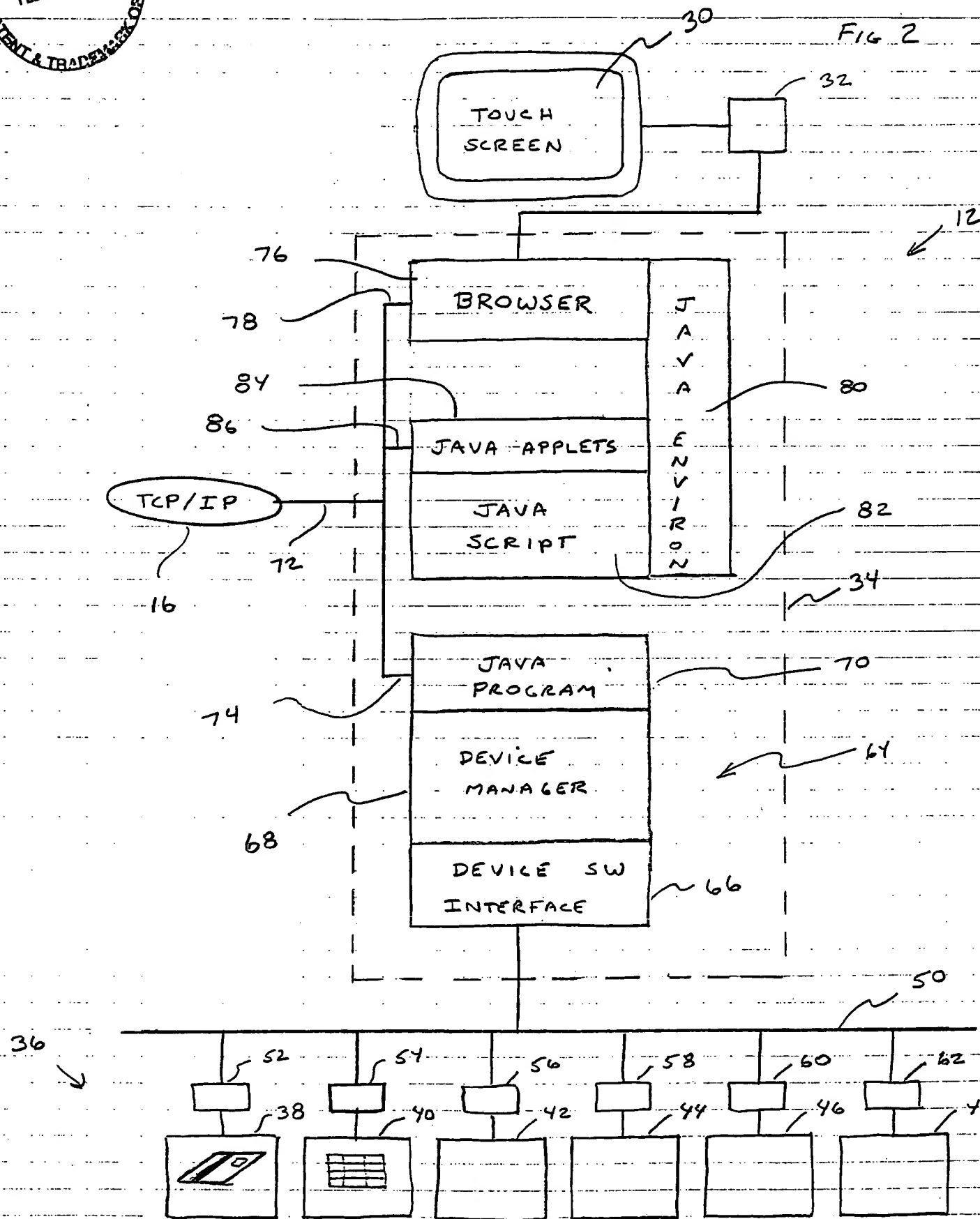


FIG 2



CARD
READER

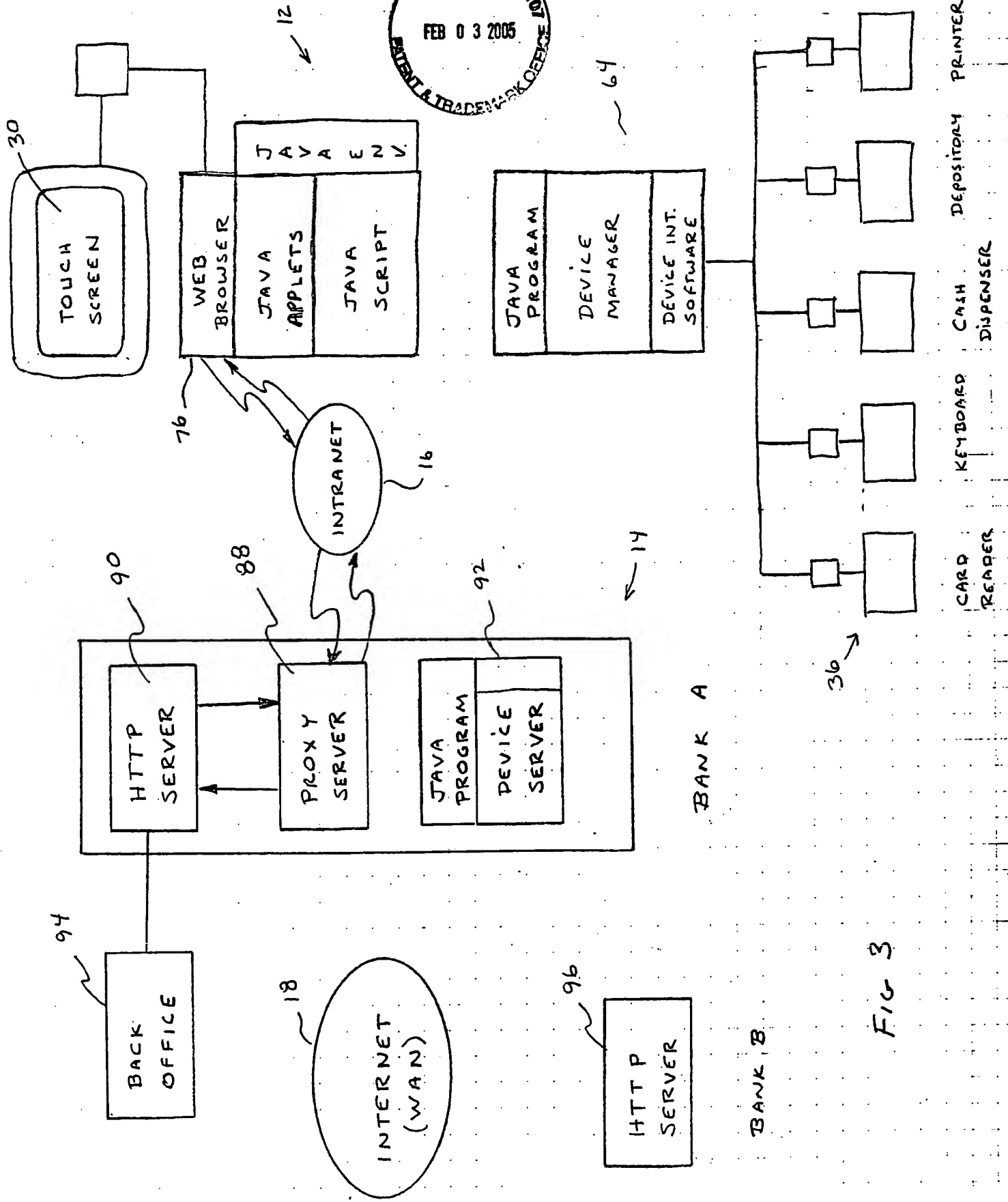
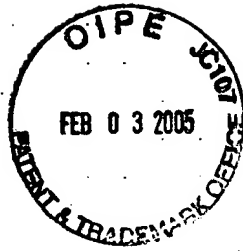
KEYBOARD

CASH
DISPENSER

DEPOSITORY

RECEIPT
PRINTER

JOURNAL
PRINTER



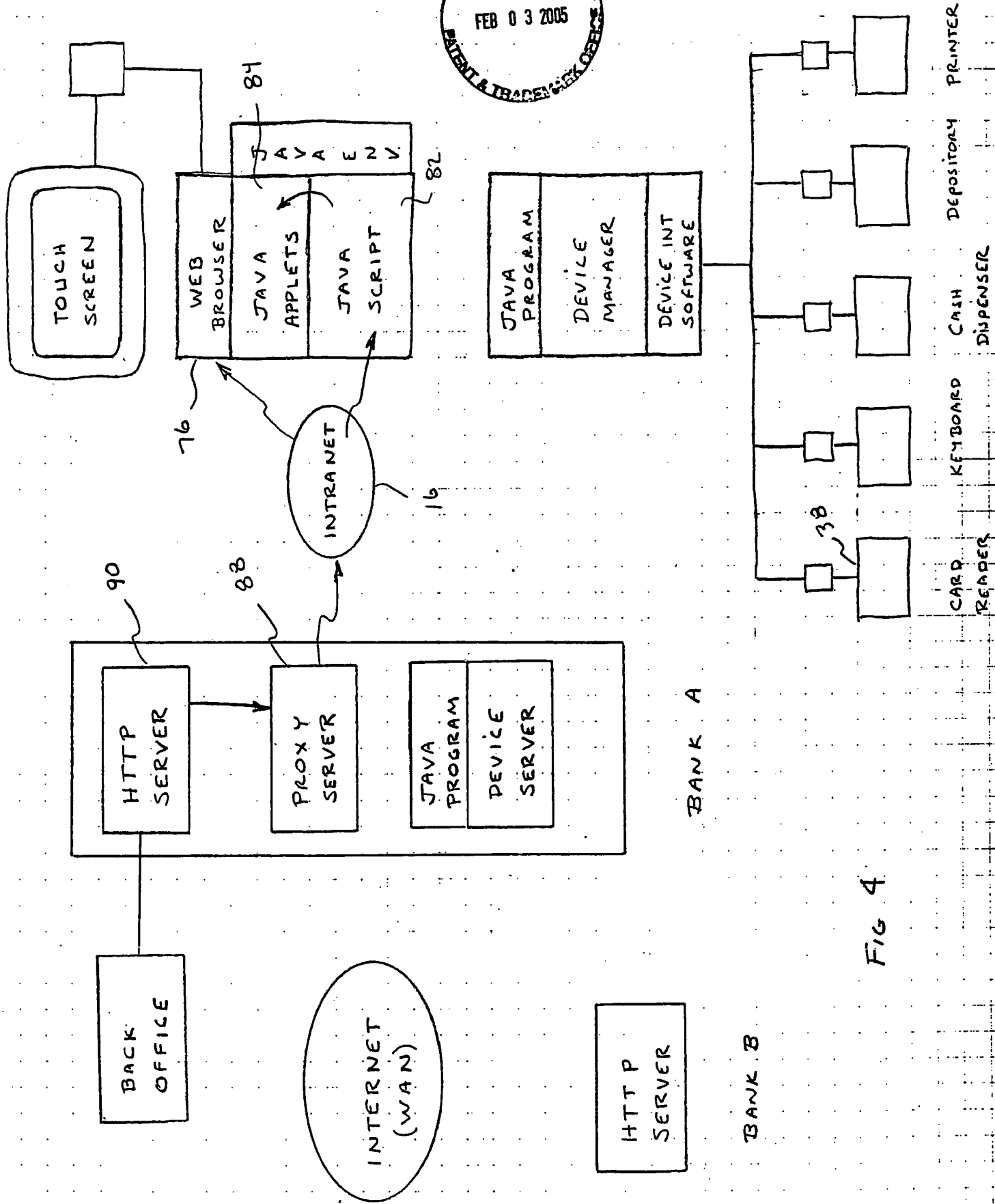


FIG 4

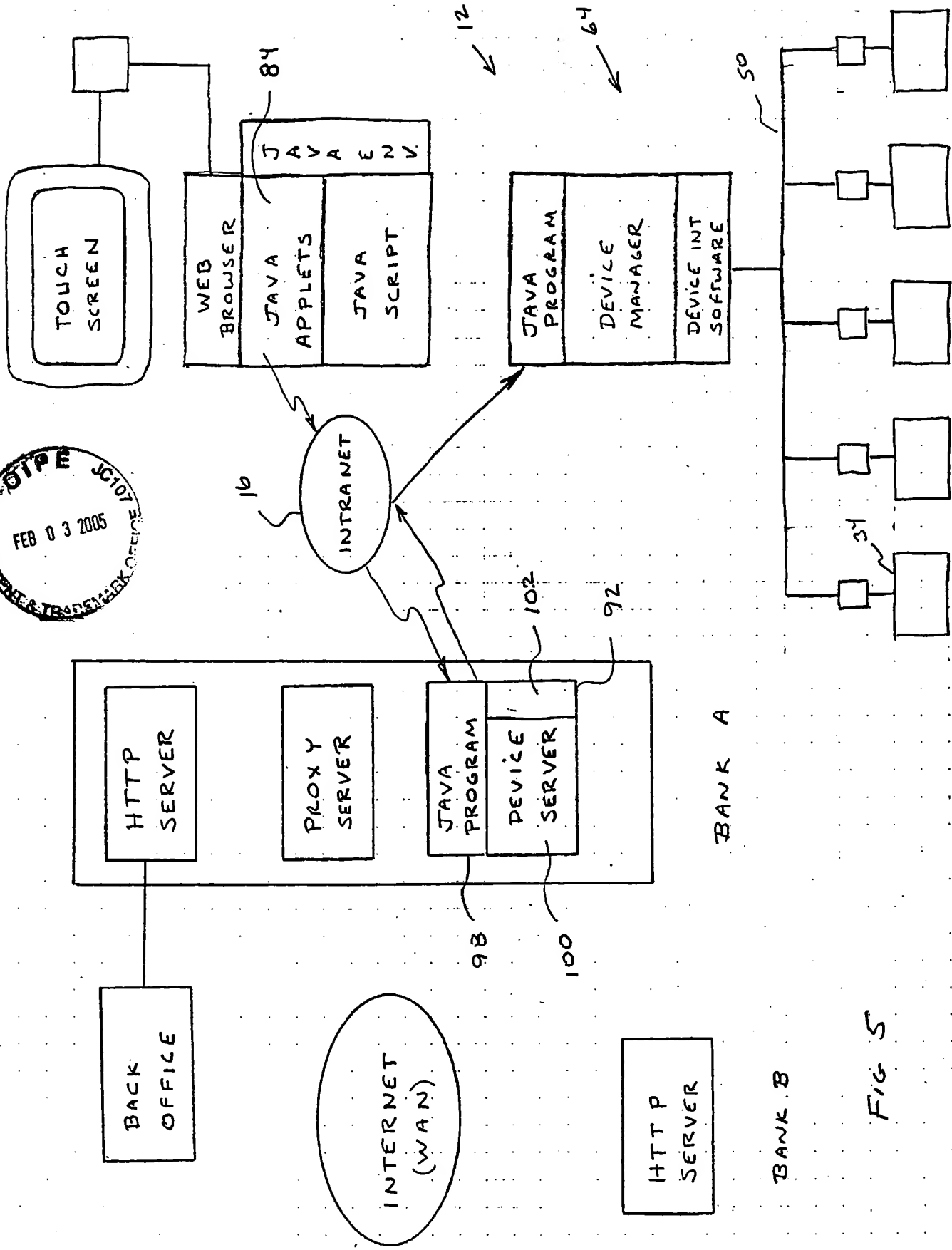
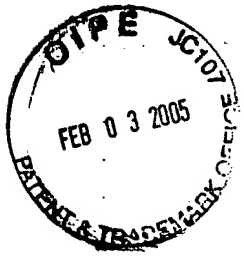


FIG 5

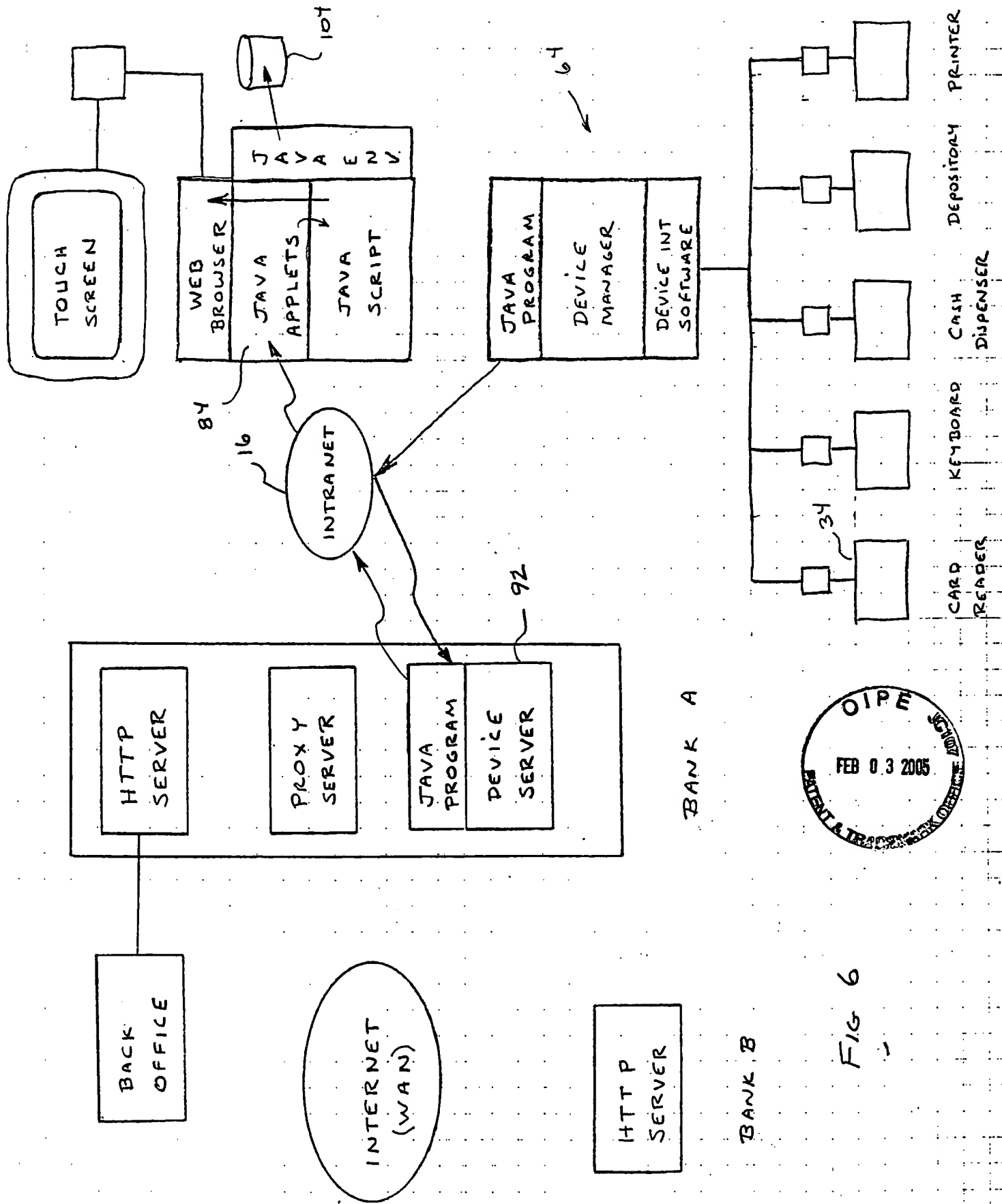


Fig 6

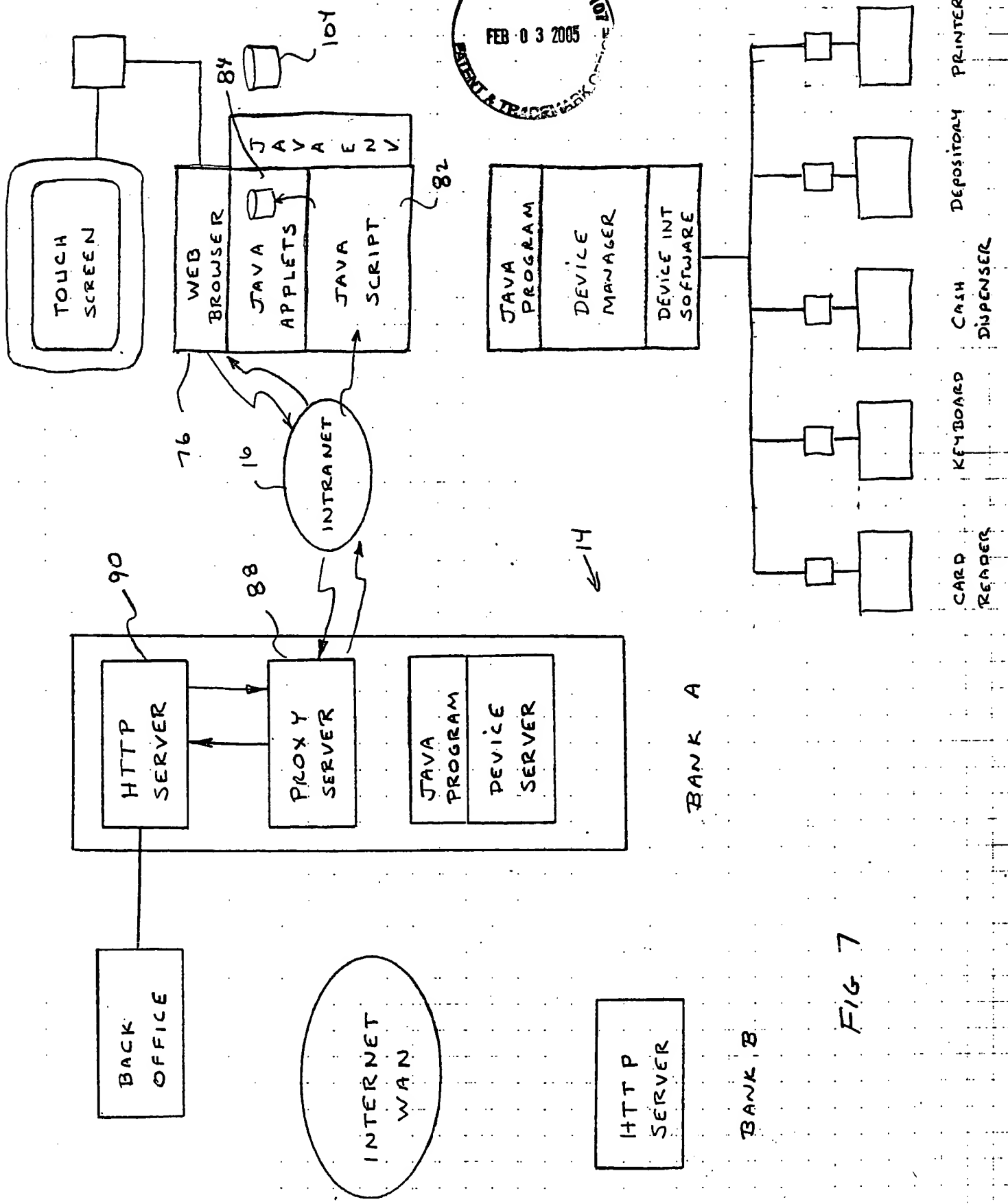
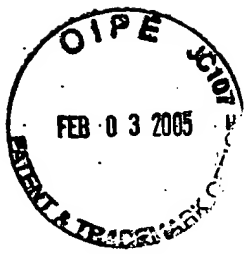


FIG 7

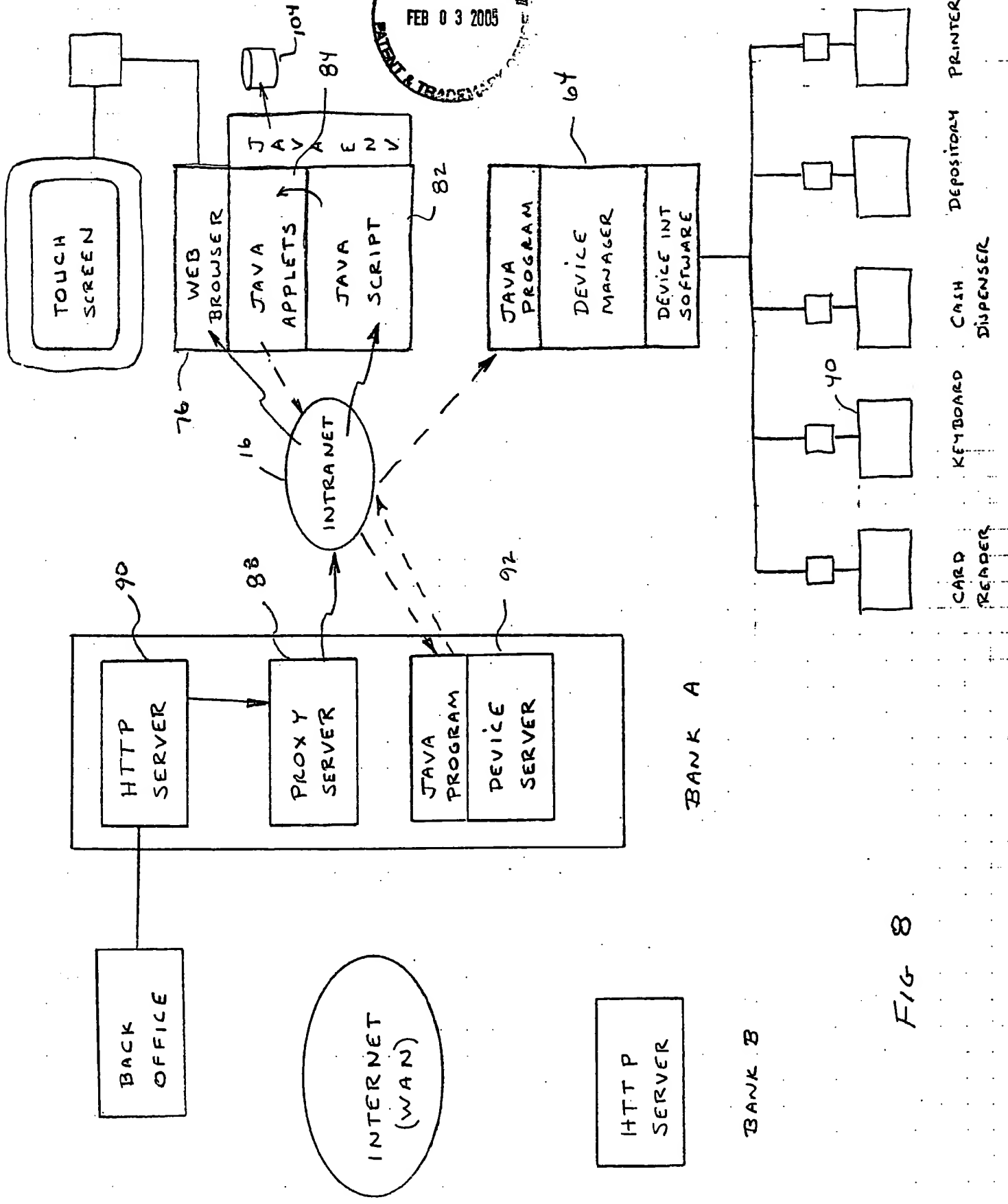


FIG 8

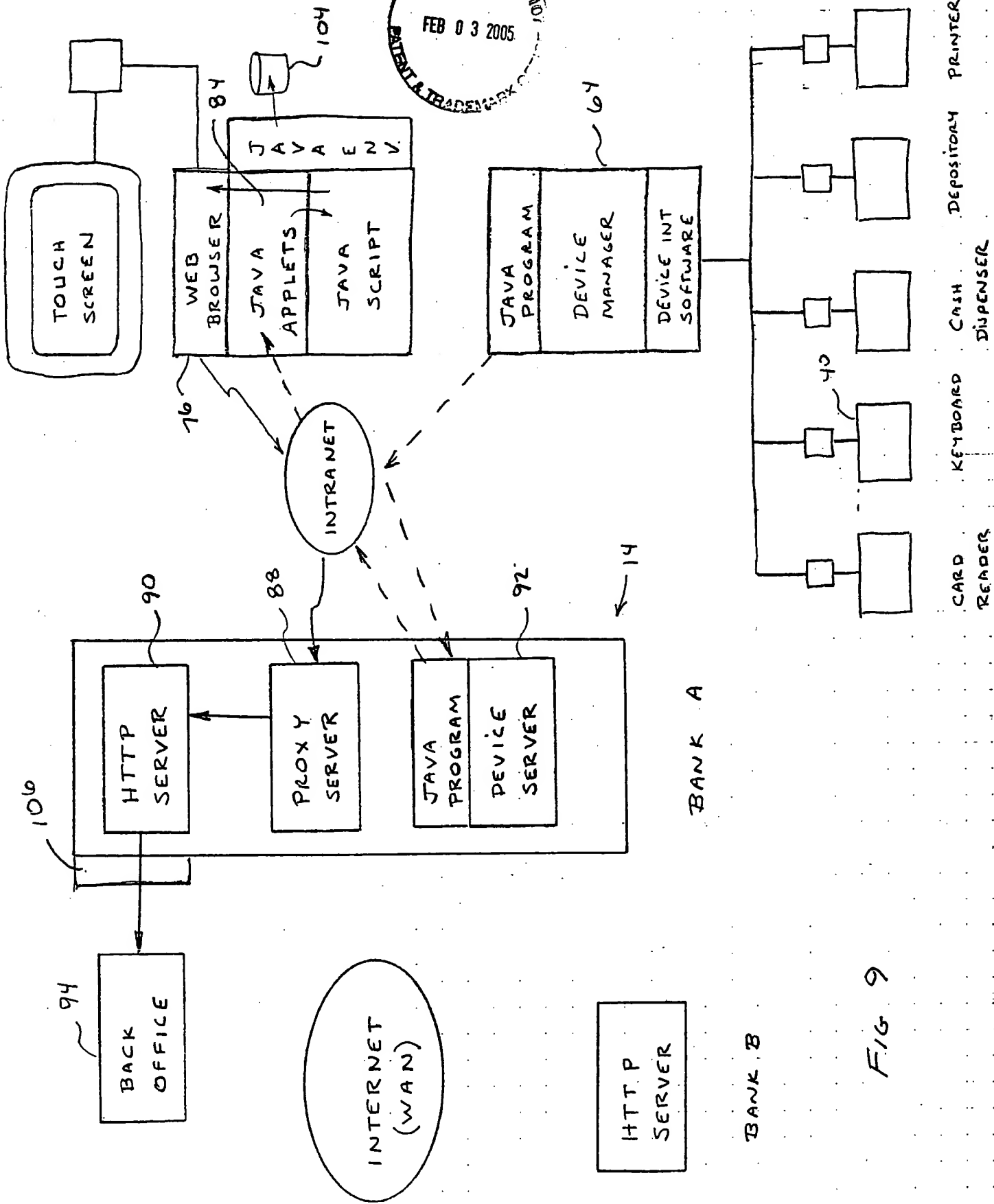
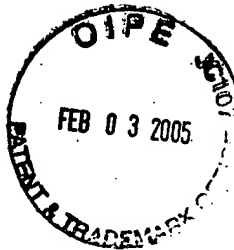


FIG 9

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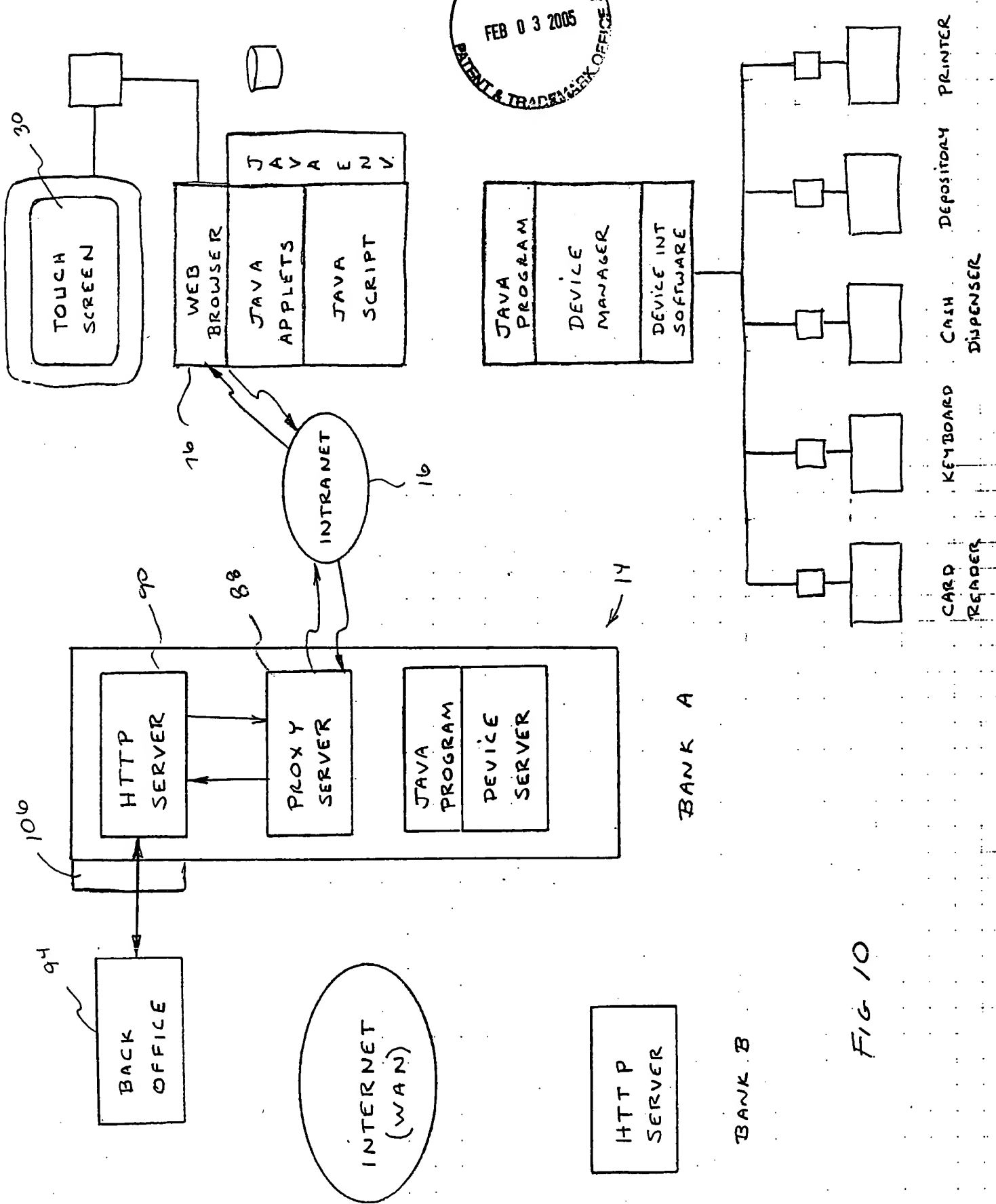
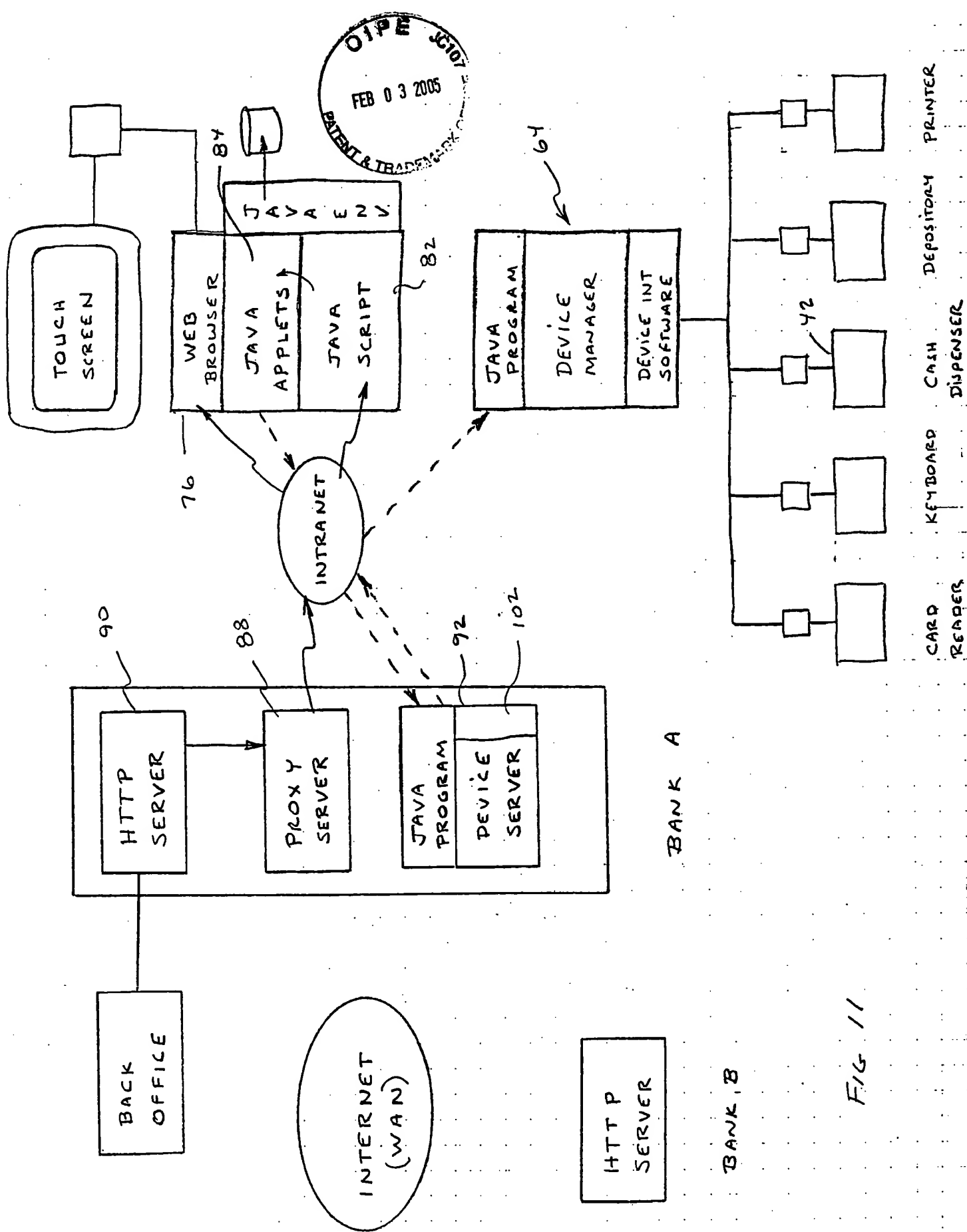
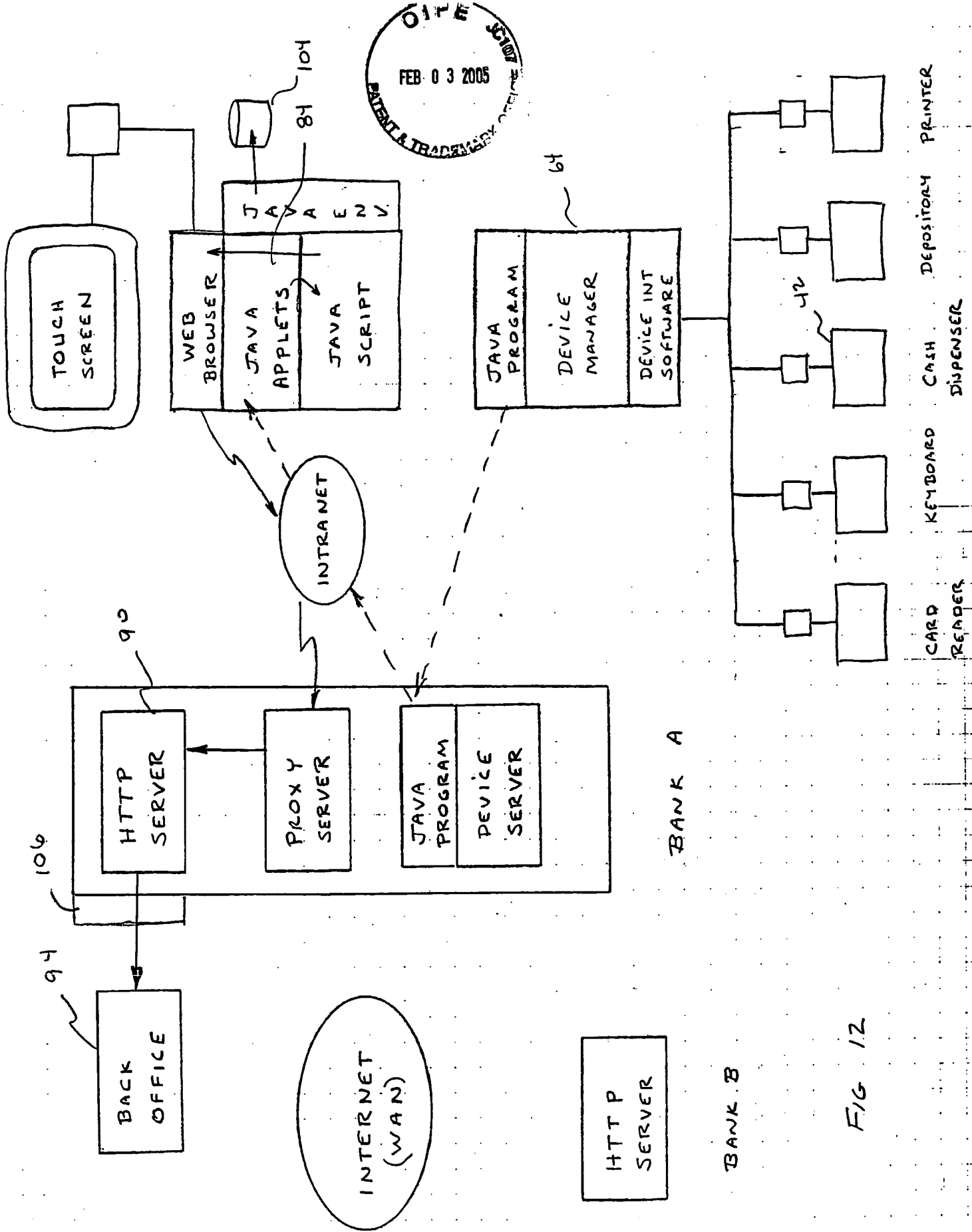


FIG 10





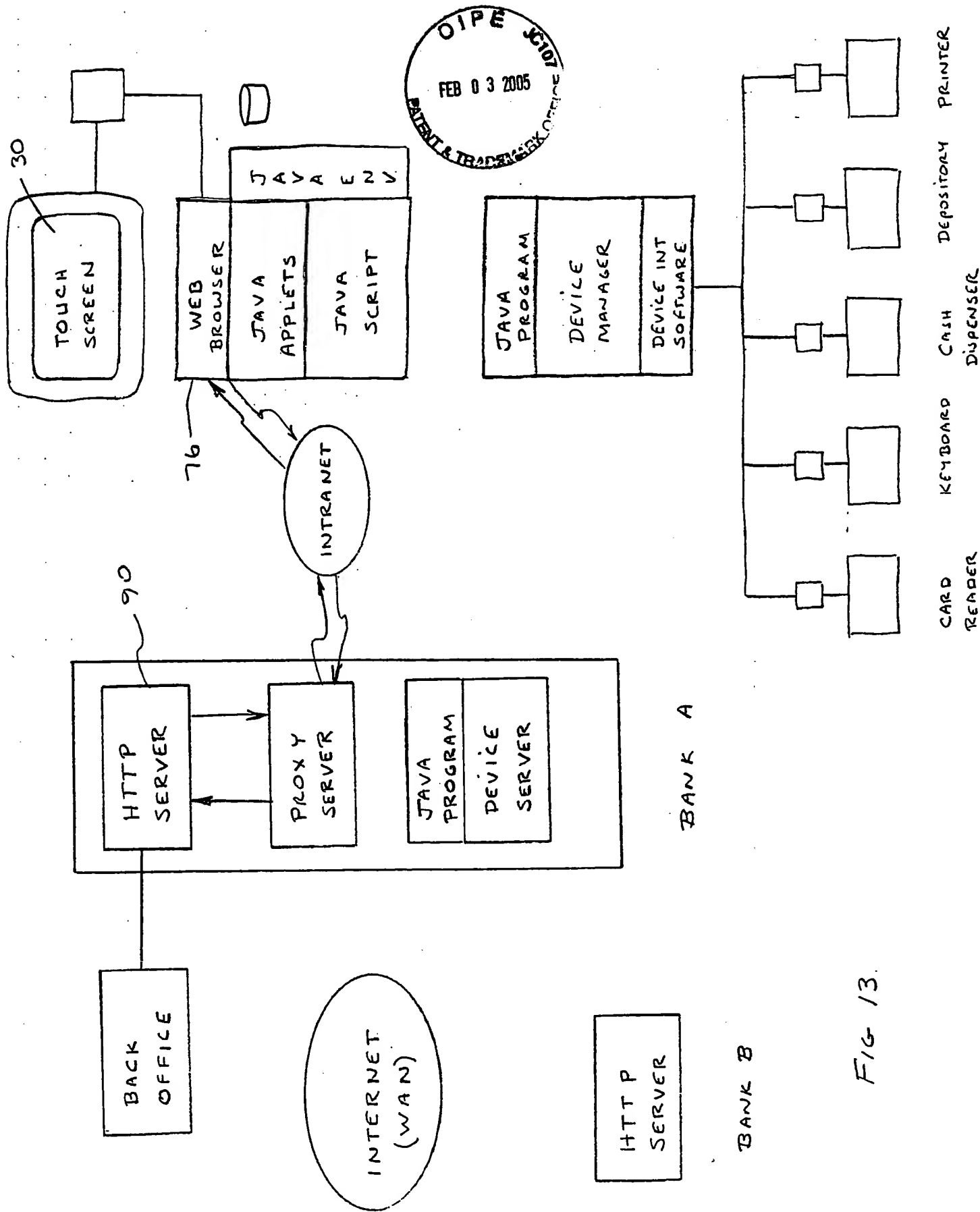
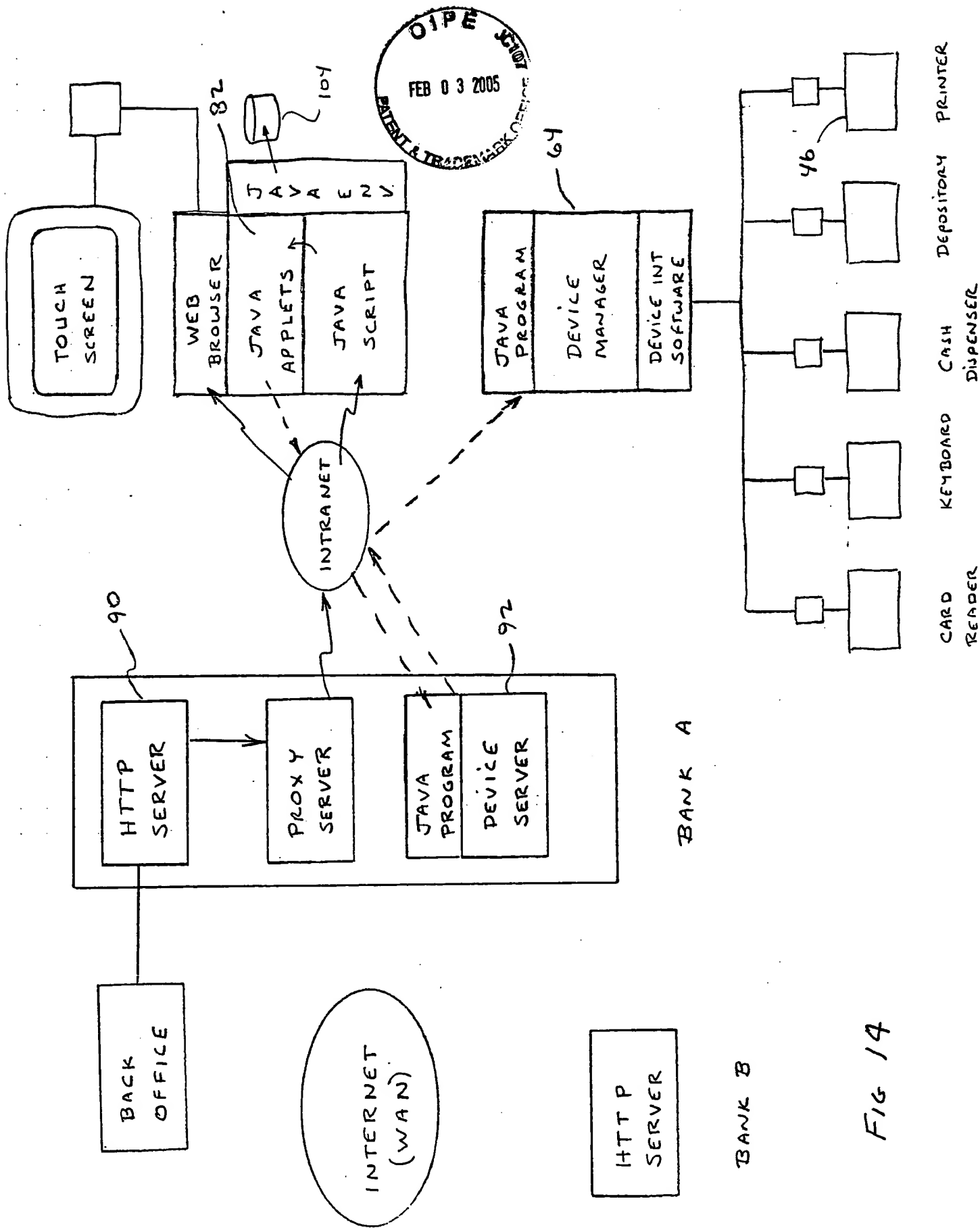


FIG 13.



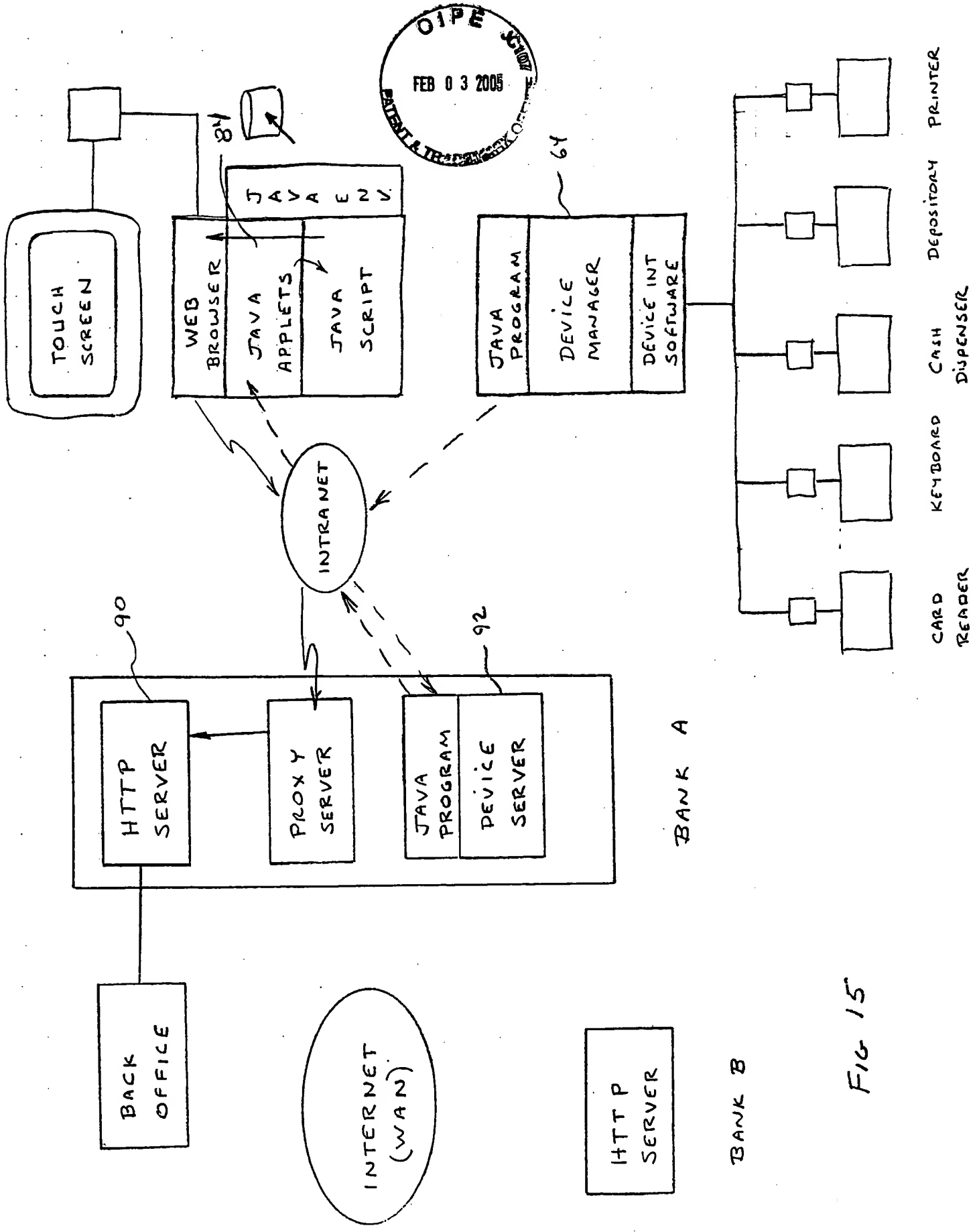
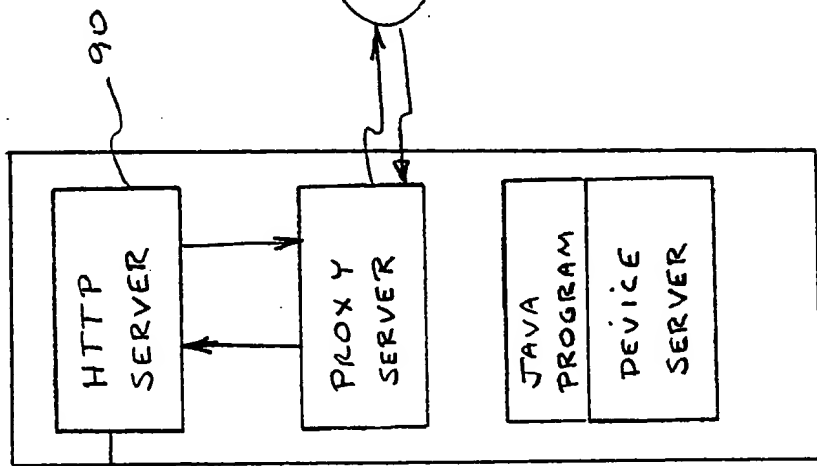
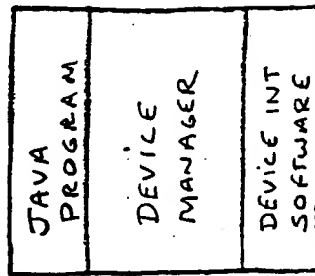
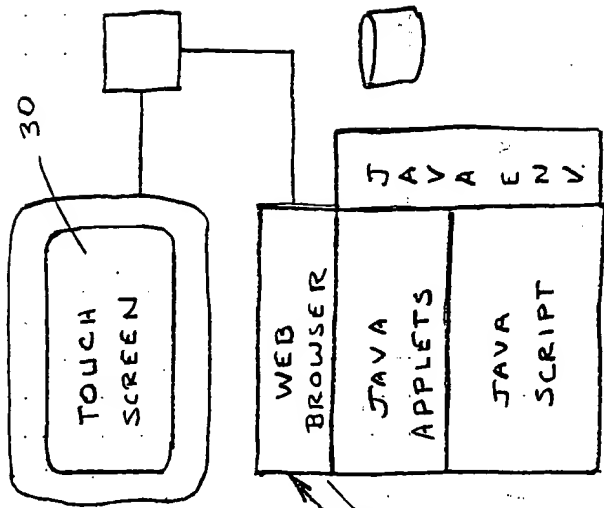
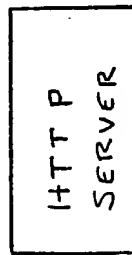
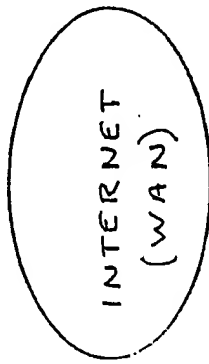
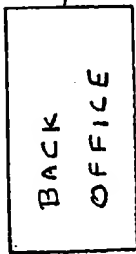


FIG 15

30



BANK A



BANK B

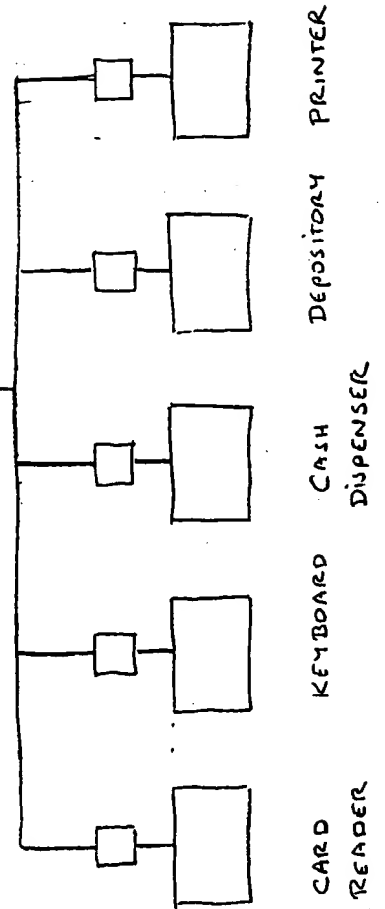


Fig 16

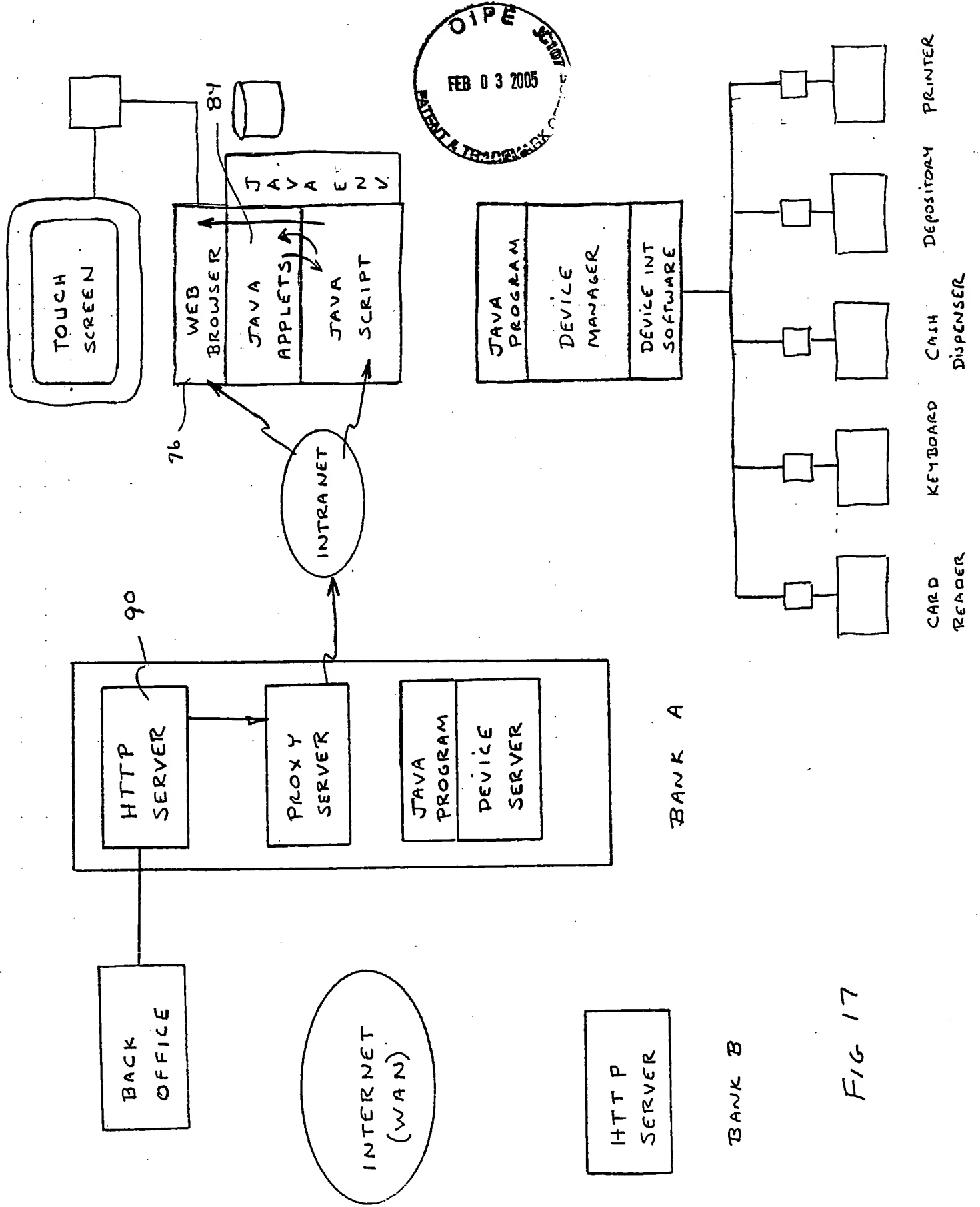


FIG 17

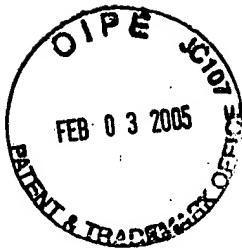
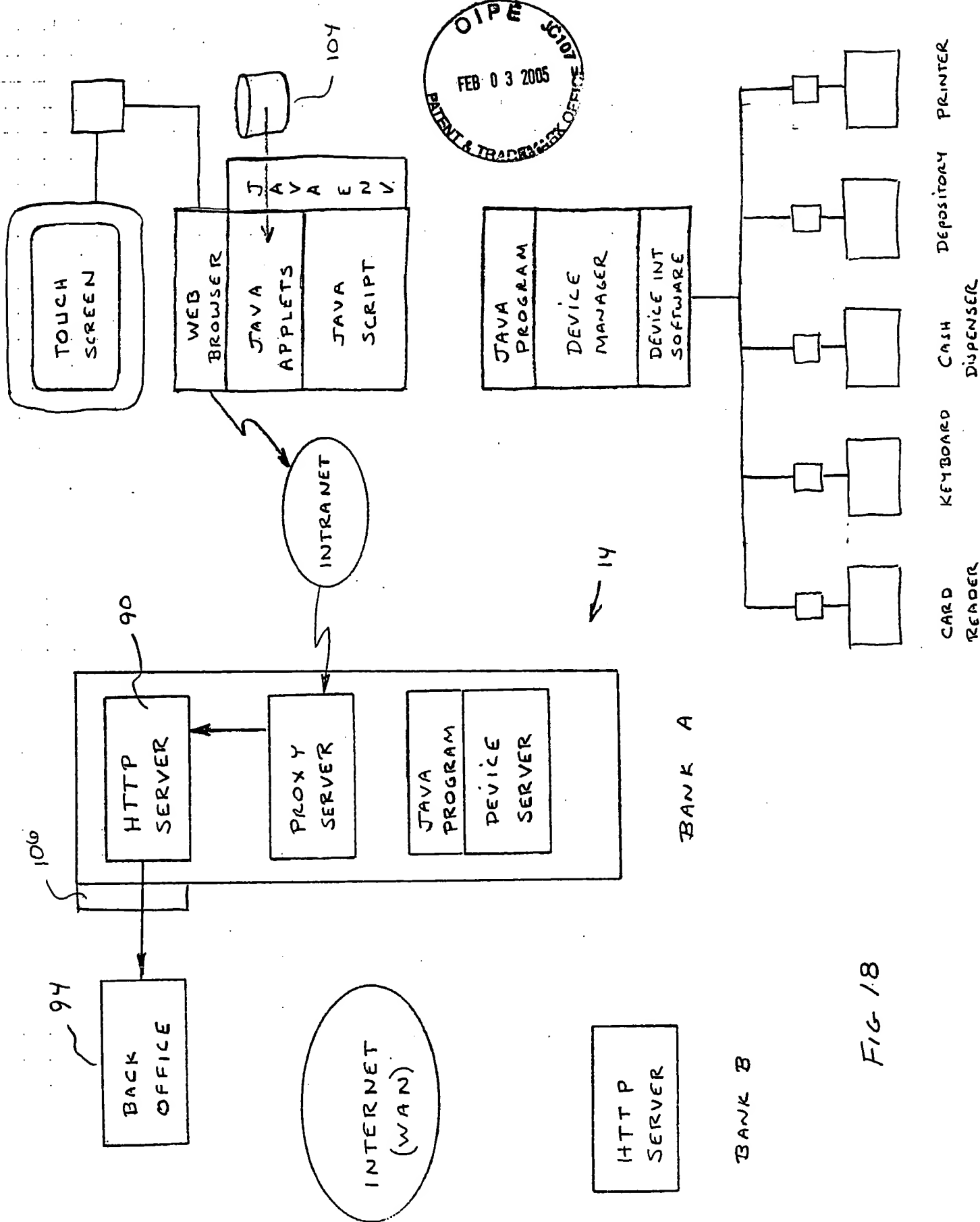


FIG 18

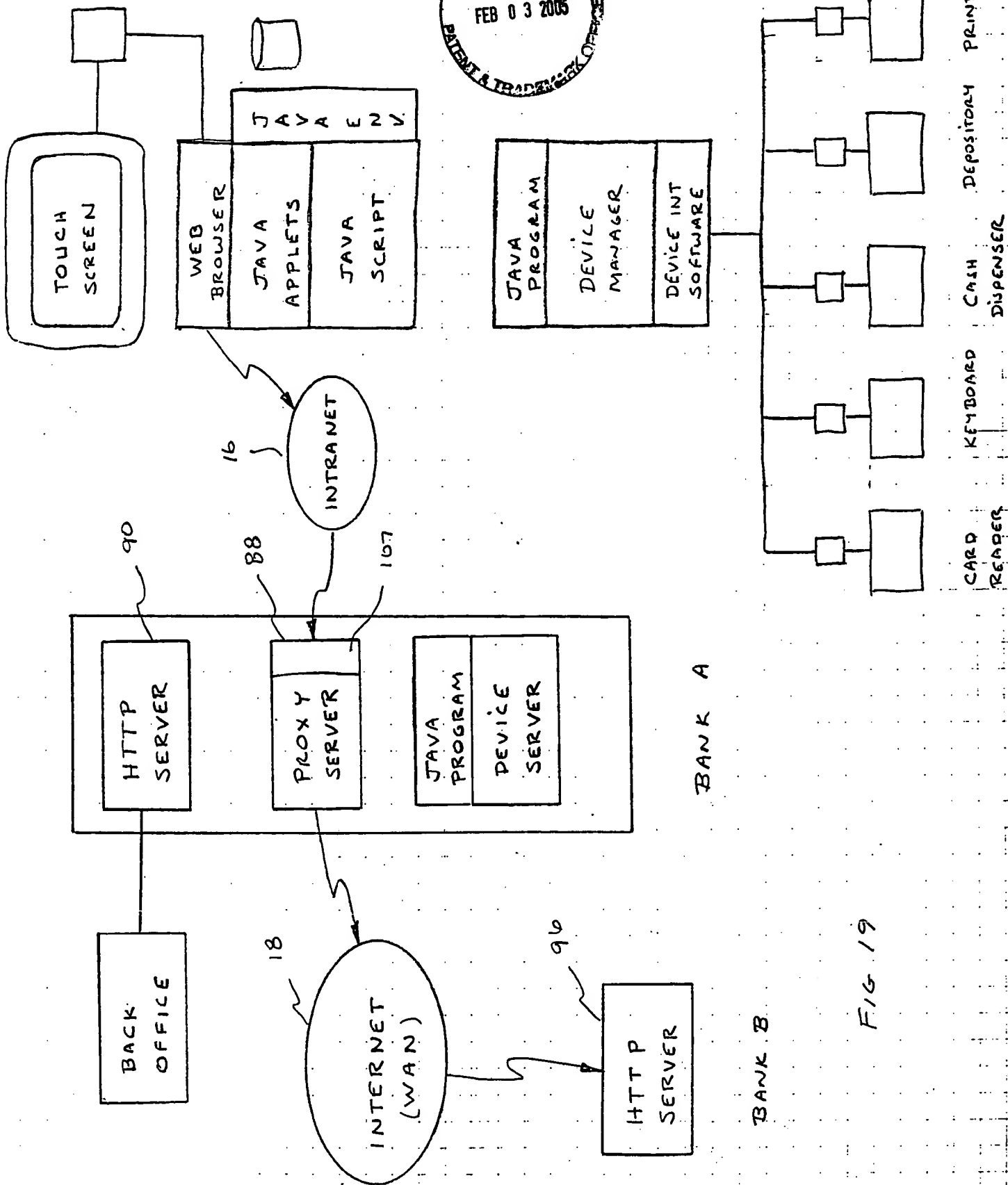
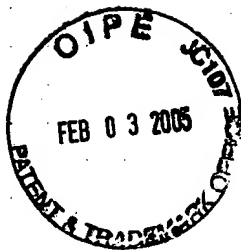


FIG 19

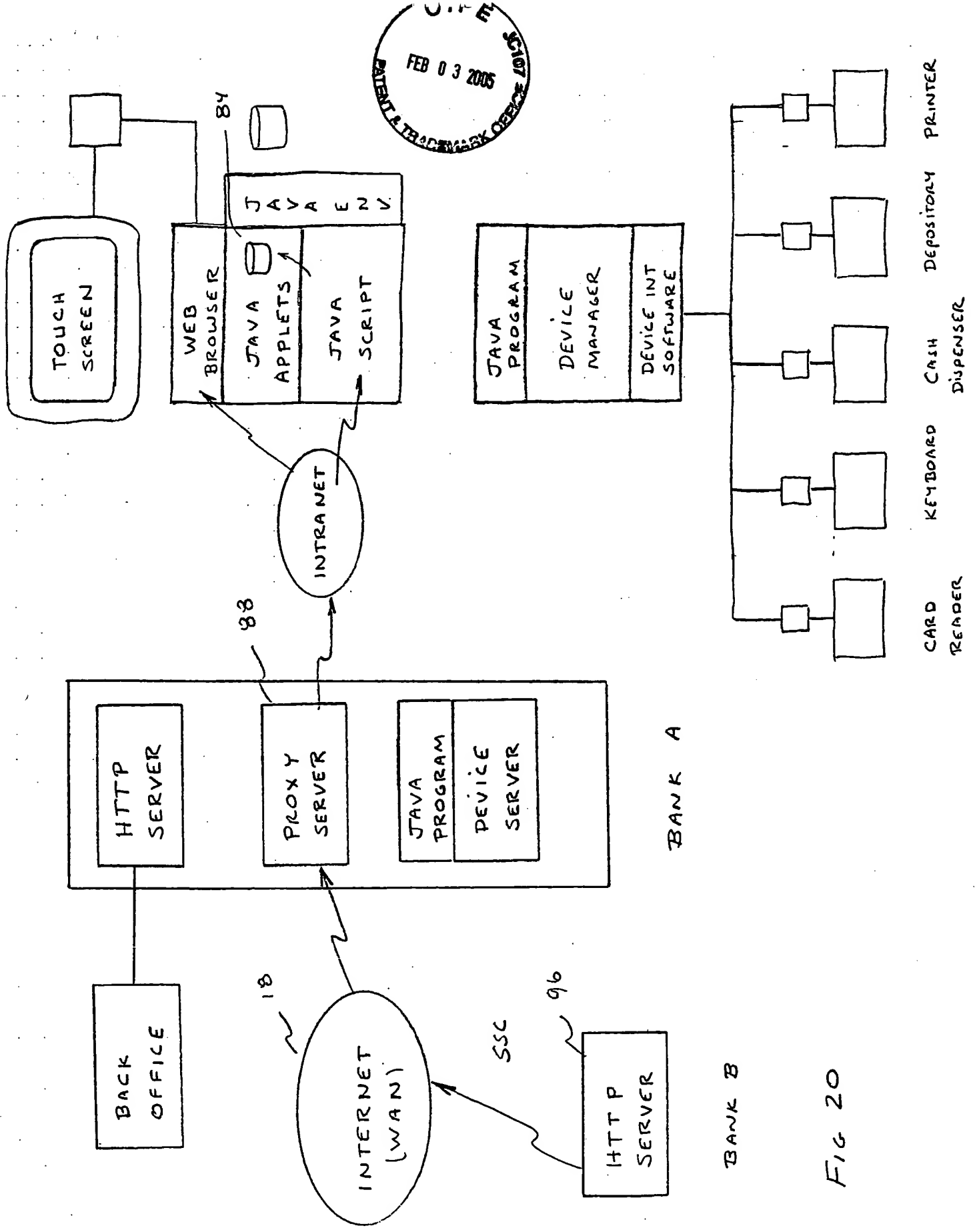


FIG 20

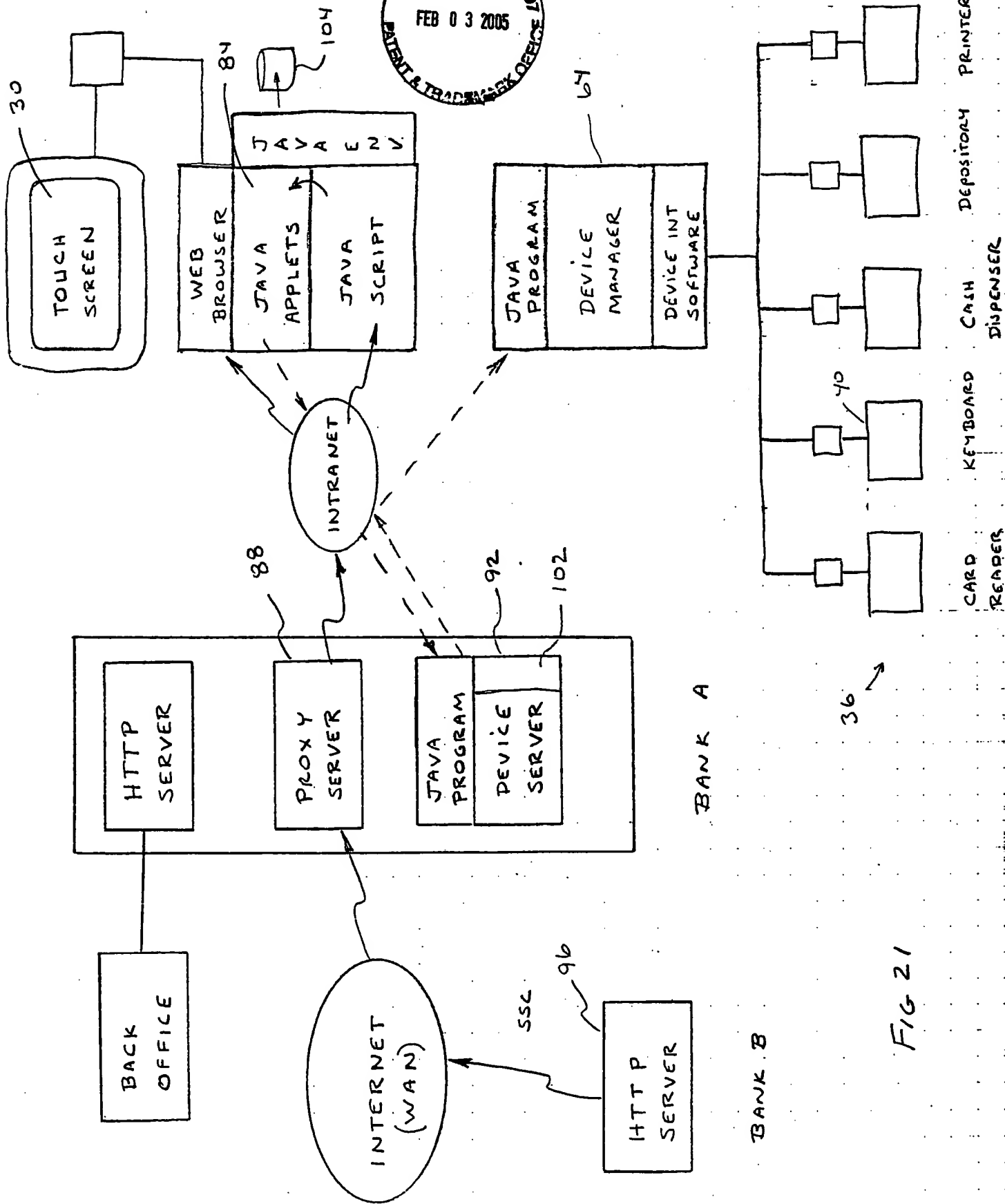
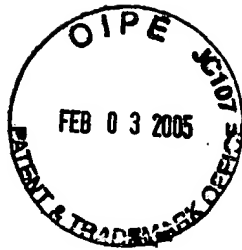


FIG 21

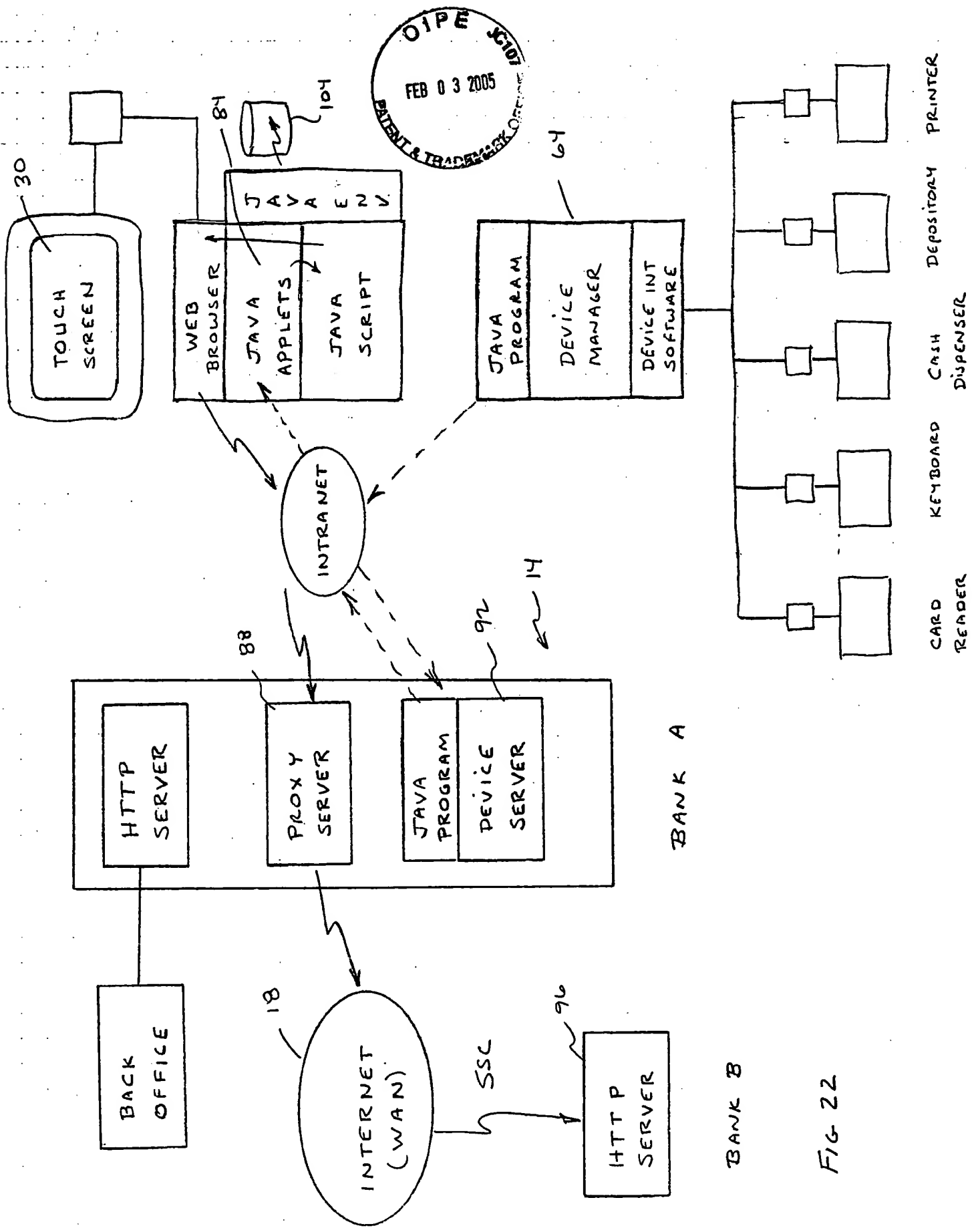


FIG 22

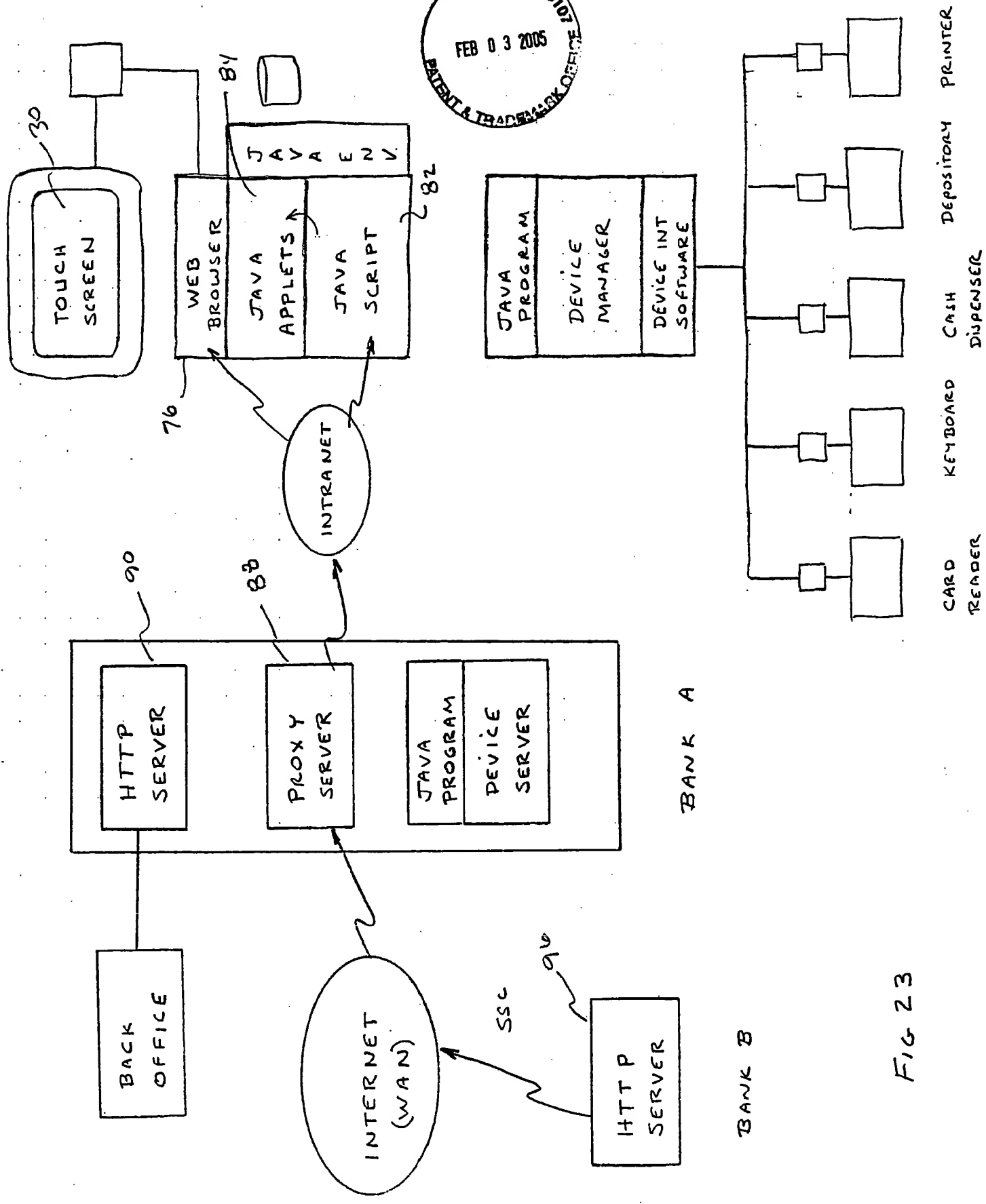
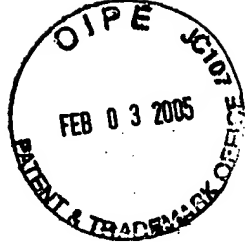


FIG 23

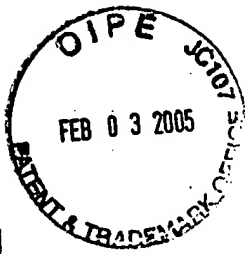
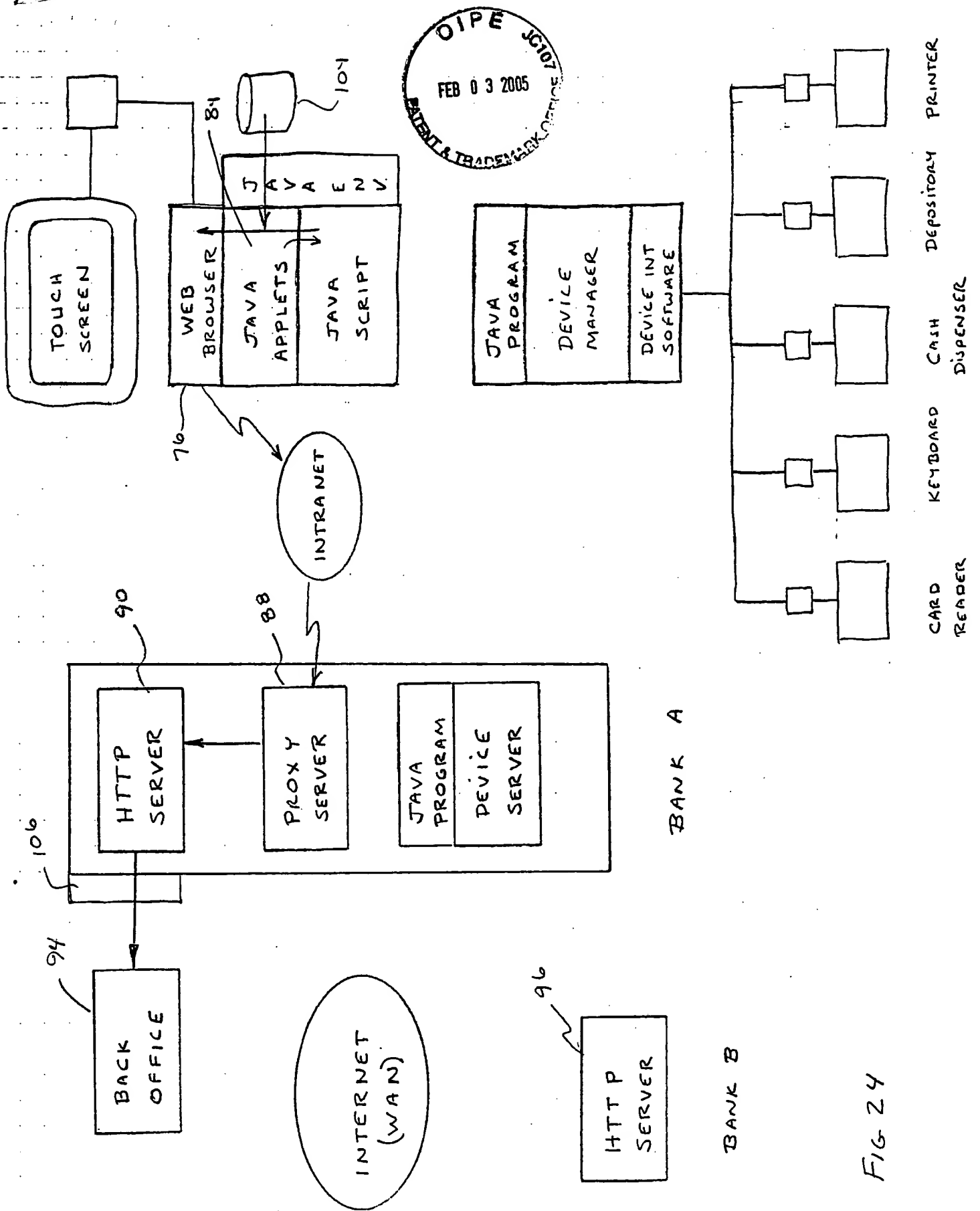


FIG 24

10/09/96

Class	Subclass

ISSUE CLASSIFICATION

PROVISIONAL PTO
APPROVAL NUMBER
10/09/96

SERIAL NUMBER 604020,095 PROVISIONAL	FILING DATE 10/09/96	CLASS	SUBCLASS	GROUP ART UNIT	EXAMINER
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RAY KOLLING, SAN MATEO, CA; MICHAEL COCHING, CASTRO VALLEY, CA; JEFFREY ROUGHGARDEN, REDWOOD CITY, CA; JAMES HAYWARD, SHAWNIGAN LAKE, CANADA.

APPLICANTS

CONTINUING DATA***
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FOREIGN/PCT APPLICATIONS***
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FOREIGN FILING LICENSE GRANTED 11/09/96

Foreign priority claimed 35 USC 119 conditions met	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no	AS FILED →	STATE OR COUNTRY CA	SHEETS DRWGS. 25	TOTAL CLAIMS	INDEP. CLAIMS	FILING FEE RECEIVED \$150.00	ATTORNEY'S DOCKET NO. 95000.952
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HECKER & HARRIMAN
2029 CENTURY PARK EAST
SUITE 1000
LOS ANGELES CA 90067

ADDRESS

ELECTRONIC STATEMENT PRESENTATION

TITLE

U.S. DEPT. OF COMM./PAT. & TM—PTO-436L (Rev.12-94)

no

60028095



10/29/96

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PATENT APPLICATION



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PTO-1556
(5/87)

66500 U.S. PTO



PROVISIONAL APPLICATION >FOR PATENT< COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION >FOR PATENT< under 37 CFR 1.53 (b)(2).

Docket Number		95000.952		Type a plus sign (+) inside this box →	+
INVENTOR(s)/APPLICANT(s)					
LAST NAME	FIRST NAME	MIDDLE >NAME/< INITIAL	RESIDENCE (CITY AND EITHER STATE OR FOREIGN COUNTRY)		
Kolling	Ray		San Mateo, California CA		
Occhino	Michael		Castro Valley, California CA		
Roughgarden	Jeffrey		Redwood City, California CA		
Hayward	James		Shawnigan Lake, Canada CA		
TITLE OF THE INVENTION (280 characters max)					
Electronic Statement Presentation					
CORRESPONDENCE ADDRESS >(including country if not United States)<					
HECKER & HARRIMAN 2029 Century Park East Suite 1600 Los Angeles, California 90067					
ENCLOSED APPLICATION PARTS (check all that apply)					
<input checked="" type="checkbox"/> Specification	Number of Pages	189	<input type="checkbox"/> Small Entity Statement		
<input checked="" type="checkbox"/> Drawing(s)	Number of Sheets	25	<input checked="" type="checkbox"/> Other (specify)	Return postcard	
METHOD OF PAYMENT (check one)					
<input checked="" type="checkbox"/> A check or money order is enclosed to cover the Provisional filing fees				PROVISIONAL FILING FREE AMOUNT (\$)	\$150.00
<input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge filing fees and credit Deposit Account Number:	08-1520				

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted

SIGNATURE

TYPED or PRINTED NAME Gary A. Hecker

Date 10 / 9 / 96

REGISTRATION NO.
(if appropriate)

31,023

☐ Additional inventors are being named on separately numbered sheets attached hereto

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PROVISIONAL
UNITED STATES PATENT APPLICATION

FOR

ELECTRONIC STATEMENT
PRESENTATION

USPTO60026095-1009956

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10/9/96
Date

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

5 The present invention relates to the field of electronic billing and paying systems. More particularly, the present invention relates to an electronic statement delivery system.

2. BACKGROUND ART

10

Every month, millions of customers receive bills and other monthly statements from utilities, banks, stores, credit card companies, insurance companies, and other service providers. Almost all of these bills are sent by mail. A typical bill includes four primary components:

15

1. Summary information. Typically includes an amount due, a due date, a customer account number, a biller name and address. The summary information is often printed on a detachable remittance stub that is intended to be returned by the customer with a check for payment.

20

2. A pre-addressed return envelope.

3. Detailed invoice of charges. Typically includes a detailed listing of the charges accrued. For example, if the bill is a telephone company bill, the
25 detailed invoice will list details of each toll call. The detailed information may include legally mandated information, particularly if the biller is a public utility. For example, an electric company may be required to list monthly or yearly

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comparisons of a customer's energy use. The content and format of such legally mandated information may vary from one legal jurisdiction (town, county, state) to another.

5 4. Marketing materials. Billers typically include information such as newsletters announcing new products or services, and often also include third party advertising pieces.

10 A customer typically pays a bill by writing a check for the amount due, placing the check and the remittance stub in the return envelope, sealing and stamping the envelope, and placing it in the mail.

15 For every bill received and paid by a customer, a billing institution (biller) has to perform numerous paper handling tasks. First the biller has to generate the bill and mail it to the customer. The bill generation process involves retrieving billing data for a customer, formatting the billing data in the legally prescribed manner, printing each customer's bill, placing the bill and other included materials in an envelope, and mailing the envelope to the customer. The biller also has to process the payment remittance received. Remittance
20 processing involves opening envelopes, identifying the customer's account, extracting the check, and presenting the check for payment. Given the large volume of bills sent out and payments received each month, the paper handling involved is a large and expensive undertaking.

25 Various systems have been proposed to reduce the paper handling involved in bill paying and remittance processing. For example, there exist electronic bill payment service bureaus that allow customers to electronically

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pay their bills via a home computer or telephone. Although use of these bureaus make bill paying more convenient for customers, they make remittance processing more expensive for billers. When using a bill payment service, a customer directs the service bureau to make payments to the biller. The
5 payment origination is usually done electronically. As a result, the remittance is not presented to the biller in the usual way, i.e. a check with the biller's remittance stub in a single envelope. Instead the biller usually receives a check printed by the service bureau drawn on the customer's bank account. Instead of
10 being accompanied by a remittance stub, the customer's account number with the biller is printed on the check. Because this form of remittance is different from the usual remittance received by the biller, the biller must process it in a special manner, incurring additional expenses.

U.S. Patent No. 5,465,206, issued November 7, 1995, for "Electronic Bill
15 Pay System", assigned to the assignee of the present invention and incorporated herein by reference, discloses a bill pay system that allows customers to pay bills to participating billers through a centralized payment network operating according to preset rules. The participating customers receive bills from participating billers which indicate an amount owed and a unique biller
20 identification number, which is assigned by the payment network. The bills may be mailed bills, e-mail notices, or implied bills for automatic debts. To authorize a remittance, a customer transmits to its bank, which is a participating bank, a bill pay order indicating a payment date, a payment amount, the customer's account number with the biller, a source of funds, and the biller's
25 biller identification number. The customer's bank then submits a payment message to a payment network. The payment network forwards the payment message to the biller's bank. For settlement, the customer's bank debits the

customer's account and is obligated to a net position with the payment network. Likewise, the biller's bank receives a net position from the payment network and credits the biller's bank account. The customer initiates bill pay orders manually via paper correspondence, at an ATM, via PC, or via telephone keypad.

5

Prior art systems have primarily addressed the bill payment portion of customer bill processing. The bill generation and presentation portion of customer bill processing has not yet been satisfactorily addressed. U.S. Patent No. 5,465,206 suggests that bills may be sent electronically by e-mail, but does not elaborate. U.S. Patent No. 5,007,084 for "Payment Authorization and Information Device", issued April 9, 1991, describes a home terminal for receiving and printing out billing information. The billing data is simple text data received by the customer via an encoded signal broadcast by a centralized invoice distribution center during vertical blanking intervals of a television broadcast or via telephone lines and a modem. A special device is used to decode and print out a hard copy of the received text. The same device can be used to pay the bill electronically.

10

15

The electronic bills delivered by these systems consist of simple text messages. As such, the electronic bills cannot deliver the same variety of information and materials as, and are therefore a poor substitute for, traditional mailed paper bills.

20

SUMMARY OF THE INVENTION

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The present invention consists of an electronic invoice presentation (EIP) system that can be used in conjunction with an electronic bill pay system to provide a comprehensive electronic bill generation, presentation, and payment system. Participants include consumers, consumer financial institutions or service providers (CSI/SP), a transport network, biller banks, and billers. Components of the system include a Universal Biller File (UBF), a set of control and maintenance transactions, and an invoice delivery system. The UBF is a control file containing key information about all billers participating in the EIP service. The UBF is used to identify billers, to communicate biller service options, to perform process edits on data transported between a CSI/SP and a biller, and to support CFI/SP service packaging. The control and maintenance transactions include service requests, biller requests/confirmations, and CFI/SP notification. These transactions ensure that the EIP service performs with certainty and flexibility. The invoice delivery system supports a variety of invoice types and delivery options, including delivery of summary invoices to a consumer by a certified CFI/SP (a certified CFI/SP is a CFI/SP that meets certain minimum security requirements), delivery of full detail invoices supporting biller defined graphics and colors by a certified CFI/SP, and invoice notification by an uncertified CFI/SP with delivery of summary or full detail invoices by a central secure facility. The present invention provides a secure electronic invoice presentation system that is flexible enough to accommodate almost any biller and any bill or invoice format, and allows convenient and secure delivery to consumers.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic diagram illustrating the topology of one embodiment of the electronic invoice delivery system of the present invention.

Figure 2 is a block diagram illustrating the process for adding a biller to the universal biller file for one embodiment of the present invention.

Figure 3 is a schematic diagram illustrating the data flow in a customer request transaction for one embodiment of the present invention.

Figure 4 is a block diagram illustrating a customer request transaction for one embodiment of the present invention.

Figure 5 is a block diagram illustrating a customer activation request transaction for one embodiment of the present invention.

Figure 6 illustrates Type I invoice presentation in one embodiment of the present invention.

Figure 7 is an illustration of a Type I invoice of one embodiment of the present invention.

Figure 8 illustrates Type II invoice presentation in one embodiment of the present invention.

Figure 9 is an illustration of a Type II invoice of one embodiment of the present invention.

Figure 10 illustrates Type III invoice presentation in one embodiment of the present invention.

Figure 11 is a block diagram illustrating a customer change in type of invoice request transaction for one embodiment of the present invention.

Figure 12 is a block diagram illustrating a customer change personal information request transaction for one embodiment of the present invention.

Figure 13 is a block diagram illustrating a customer request for deactivation of service for one embodiment of the present invention.

Figure 14 is a block diagram illustrating a request for changing the invoice destination node for one embodiment of the present invention.

Figure 15 is a block diagram illustrating a customer change paper invoice delivery option request transaction for one embodiment of the present invention.

Figure 16 is a block diagram illustrating a customer request for Type I or Type II replacement invoice transaction for one embodiment of the present invention.

Figure 17 is a block diagram illustrating a customer request for Type III replacement invoice transaction for one embodiment of the present invention.

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Figure 18 is a block diagram illustrating a customer request for a paper copy of an invoice transaction for one embodiment of the present invention.

5 Figure 19 is a block diagram illustrating a biller confirmation of a customer service request transaction for one embodiment of the present invention.

10 Figure 20 is a block diagram illustrating a biller notification of change in UBF option transaction for one embodiment of the present invention.

Figure 21 is a block diagram illustrating a biller deactivation of customer account transaction for one embodiment of the present invention.

15 Figure 22 is a block diagram illustrating a CFI/SP invoice undeliverable notification to biller transaction for one embodiment of the present invention.

20 Figure 23 is a block diagram illustrating a CFI/SP notification of invoice non-delivery transaction for Type I and Type II invoice delivery for one embodiment of the present invention.

25 Figure 24 is a block diagram illustrating a system manager notification of invoice non-delivery transaction for Type III invoice delivery for one embodiment of the present invention.

Figure 25 is a block diagram illustrating a CFI/SP positive confirmation of invoice delivery transaction for Type I and Type II invoice delivery for one embodiment of the present invention.

5 Figure 26 is a block diagram illustrating a system manager positive confirmation of invoice delivery transaction for Type III invoice delivery for one embodiment of the present invention.

10 Figure 27 is a schematic diagram of an example computer system that can be used for a customer, biller, bank, or system manager computer system of the present invention.

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DETAILED DESCRIPTION OF THE INVENTION

In the following description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be
5 apparent to one skilled in the art, however, that the present invention may be practiced without these specific details. In other instances, well-known features have not been described in detail in order not to unnecessarily obscure the present invention.

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10 Figure 1 shows the topology of one embodiment of the electronic invoice presentation (EIP) system of the present invention. As shown in Figure 1, this embodiment includes a biller 100, a biller bank 110, a transport network 120, a customer bank 130, a customer 140, and a system manager 150. Biller 100 may be any of a variety of entities that provide products or services to customer 140.
15 Examples of entities that may be a biller 100 include utility companies, mortgage banks, credit card companies, etc. Biller bank 110 is a bank that provides EIP services to biller 100. Biller bank 110 may also provide electronic bill payment services to biller 100. Transport network 120 is a secure data communications network, such as for example the VisaNet(TM), that is used to pass messages
20 between biller bank 110 and customer bank 130. Transport network 120 may also provide additional system functions, including message verification and database maintenance. Customer bank 130 is a bank or other service provider that provides EIP services to customer 140. Customer bank 130 is also referred to herein as a CFI/SP (Consumer Financial Institution or Service Provider).
25 CFI/SP 130 may also provide electronic bill payment services to customer 140. Customer 140 is any entity that is a customer of biller 100. System manager 150 performs a variety of system management operations to insure proper operation

of an EIP system. System manager 150 may, for example, be an entity that owns transport network 120 and that provides access to biller banks and CFI/SP to an EIP system. In one embodiment of the invention, the system manager is Visa International.

5

Also included in the embodiment of Figure 1 is a Universal Biller File (UBF) 160. UBF 160 is a control file containing key information about all billers participating in the electronic invoice presentation system of Figure 1. UBF 160 contains information about billers provided to system manager 150 by the billers. UBF 160 is used to identify billers, to communicate biller service options, to perform process edits on data transported between a CSI/SP and a biller, and to support CFI/SP service packaging. UBF 160 is maintained by system manager 150. Updated copies of UBF 160 are periodically distributed by system manager 150 to the CFI/SP's including CFI/SP 130.

15

The particular information contained in a UBF varies according to the specific embodiment of the invention, but in general includes all the biller information needed by CFI/SP's and the system manager for proper operation of an EIP system. For example, in one embodiment of the present invention, the

20 UBF includes the following entries for each biller:

Biller name.

Biller address(es).

Biller unique identification number (UID).

Biller account number format.

25

Biller invoice formats.

EIP service options supported by biller.

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The biller name and biller address entries contain the biller's name and address as supplied by the biller. The biller unique identification number is a number assigned by the system manager. The biller account number format is supplied by the biller and indicates the format used by the biller for customer
5 account numbers. The biller invoice format entry is supplied by the biller and specifies the format for the electronic invoices of the biller. This entry may, for example, include an invoice template containing data fields for monthly invoice data, as well as static material that is included with each invoice. The EIP service options supported by biller entry is supplied by the biller and indicates
10 which EIP service options the biller supports.

In one embodiment of the invention, EIP service options include:

- Invoice type option.
- Paper invoice delivery option.
- 15 On-demand paper invoice delivery option.
- Personal information change option.
- Positive confirmation of invoice delivery option.

In one embodiment of the invention, there are three invoice type options,
20 designated "Type I", "Type II", and "Type III", respectively.

The Type I invoice delivery option supports limited data summary invoices only, and does not support any graphics or display instructions. Type I is suited for initial biller implementations and invoice delivery for screen phone,
25 touch tone and self-service invoice delivery devices. In this option, the biller is allowed to send a predetermined number of pre-defined data elements via the biller's bank and the transport network to a certified CFI/SP. In one

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embodiment, this predetermined number is 23. A certified CFI/SP is a CFI/SP that has met the system manager's security and other criteria, including processing, audit, and liability requirements, for handling sensitive customer billing information. In Type I invoice delivery the biller sends the invoice data to the biller bank. The biller bank forwards it via the transport network and the system manager to the certified CFI/SP. The CFI/SP holds the data until presented to the customer. When presented to the customer, the CFI/SP formats the data for display, using the invoice format for the biller specified in the UBF and the current dynamic customer data received from the biller.

Figure 6 illustrates Type I invoice presentation in one embodiment of the present invention. As shown in Figure 6, in this embodiment, biller 100 sends biller bank 110 invoice data for the invoice being presented. Biller bank 110 sends the invoice data via transport network 120 to system manager 150. System manager 150 checks to make sure the invoice data is properly formatted, and sends the invoice data via transport network 120 to certified CFI/SP 600. Certified CFI/SP 600 formats the data for display on the customer's delivery device and presents the data as a limited summary without graphics to customer 140.

Figure 7 is an illustration of a summary bill of one embodiment of the present invention as may be displayed on a customer's delivery device. The summary bill data includes the biller's name 705, the customer's account number 715, the customer's name and address 725, a listing of current and previous charges 735, an explanation of current charges 745, and a return address 755. The summary information corresponds to the information that is normally included on the remittance stub of a mailed, paper bill.

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5 Type II invoice delivery supports both summary data invoices and full detail invoices and supports biller defined color and graphics. In Type II invoice delivery, the biller, or the biller bank, creates an invoice template. The template, which may include color graphics, contains fields for customer specific invoice data. The template may also include static materials, such as marketing graphics and text. The template is stored in the biller invoice format entry of the UBF. The biller sends dynamic current invoice data for a customer to the biller bank. This invoice data is the data for the customer that is specific to the current bill. 10 For example, for an electric utility bill, the current invoice data may include the dates of usage covered by the bill, the usage amount, the amount of the last payment, the current amount due, etc. The biller bank sends the current invoice data via the transport network and system manager to the customer's certified CFI/SP. The CFI/SP assembles an invoice by retrieving the biller's invoice 15 template from the CFI/SP's copy of the UBF and merging the received invoice data. The CFI/SP holds the invoice until it is delivered to the customer.

Whether or not the details and graphics included in a Type II invoice are actually viewed by a customer depends on the type of delivery device used by 20 the customer to access the invoice. If the customer uses a "conforming" device, the customer will receive the full bill details. An example of a conforming device is a personal computer with a color monitor. If the customer uses a "non-conforming" device, however, the customer will only obtain summary invoice data. An example of a non-conforming device is a touch-tone phone.

25 Figure 8 illustrates Type II invoice presentation in one embodiment of the present invention. In this embodiment, as shown in Figure 8, biller 100 sends

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invoice data to biller bank 110. Biller bank formats the invoice data in the manner required by transport network 120 and sends the invoice data via transport network 120 to system manager 150. System manager 150 checks the invoice data for proper format, and sends the invoice data via transport network 5 120 to certified CFI/SP 600. Certified CFI/SP 600 assembles an invoice by retrieving the biller's invoice template from CFI/SP's 600 copy of UBF 160 and merging the received invoice data into the appropriate fields of the invoice template. CFI/SP 600 holds the invoice until it is delivered to the customer 140. The invoice may be delivered to the customer either in the form of summary 10 data or as detailed data with full graphics depending on the delivery device used by customer 140 and the customer's indicated bill type preference. If a biller supports Type II invoice presentation, the customer may request delivery of either a summary or detailed bill in its service activation request.

15 Figure 9 is an illustration of a detailed bill of one embodiment of the present invention as may be displayed on a conforming delivery device. Like summary invoice 700 of Figure 7, detailed invoice 900 of Figure 9 includes the biller's name 705, the customer's account number 715, the customer's name and address 725, a listing of current and previous charges 735, an explanation of 20 current charges 745, and a return address 755. In addition, detailed invoice 900 includes additional details and graphics, including a logo 950, a graph showing a comparison of present and previous monthly electricity use 910, a energy conservation message 920, and advertisements 930 and 940. Detailed invoice 900 in general may contain such detail as allows a biller to completely replace the 25 biller's mailed paper bill with electronic detailed invoice 900.

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Detailed invoice 900 contains items from the biller's invoice template, dynamic current invoice data, and static invoice data. Items from the biller's invoice template include the biller's name 705, return address 755, and logo 950. In addition, the locations for the remaining items are specified by the invoice template. Of the remaining items, customer account number 715, customer name and address 725, current and previous charges 735, explanation of current charges 745, and detailed history of energy use 910 constitute dynamic current invoice data for the customer. Energy conservation message 920 and advertisements 930 and 940 may each constitute static invoice data or dynamic current invoice data, depending on whether an item is included in all customer invoices (in which case the item constitutes static invoice data) or whether an item is specifically selected for the customer, for example based on the customer's demographics (in which case the item constitutes dynamic current invoice data). Static invoice data is changed by the biller by updating the biller's invoice template in the UBF.

Type III invoice presentation is applicable when the customer's CFI/SP is a non-certified CFI/SP. Because the customer's CFI/SP is not certified, it is not authorized to handle the customer's confidential billing information. Instead, the invoice is held by the system manager. The customer receives a message from the customer's non-certified CFI/SP indicating that a bill has arrived. The customer then contacts the system manager directly to obtain a copy of the bill. Type III invoice presentation supports detailed and summary invoices.

Figure 10 illustrates Type III invoice presentation in one embodiment of the present invention. In this embodiment, as shown in Figure 10, biller 100 sends invoice data to biller bank 110. Biller bank 110 sends the invoice data via

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transport network 120 to system manager 150. System manager 150 checks the invoice data for proper format. If the format is proper, system manager 150 retrieves the biller's invoice template from the system manager's copy of UBF 160 and assembles an invoice using the biller's invoice template and the invoice data
5 received from biller bank 110. System manager 150 sends a notice of the waiting invoice via transport network 120 to non-certified CFI/SP 1000. Non-certified CFI/SP 1000 passes on the notice of the waiting invoice to customer 140. To receive the invoice, customer 140 sends a request, for example via a dial-up modem connection, to system manager 150. System manager 150 validates the
10 customer's identity, for example using a password and/or PIN number system. Once the customer's identity has been validated, system manager 150 conveys the invoice to customer 140. System manager 150 may use the same dial-up connection used by customer 140 to transmit the invoice to customer 140, or the invoice may be presented to the customer on another display device.

15 If a biller supports Type III invoice delivery, the customer may request either detailed or summary invoices.

One embodiment of the present invention includes the following paper
20 bill delivery options that a biller may specify in the UBF:

Biller always mails paper invoice.

Biller never mails paper invoice.

Biller will activate paper invoice delivery on customer's request.

Biller will cease paper invoice delivery on customer's request.

25

One embodiment of the present invention requires the biller to deliver paper invoices together with electronic invoices, regardless of paper bill delivery option chosen, for the first three month's of EIP service.

5 One embodiment of the present invention includes two on-demand paper bill delivery options that a biller may specify in the UBF:

Biller supports option.

Biller does not support option.

10 If the biller supports the on-demand paper bill delivery option, the biller agrees to send a complete paper invoice to a customer upon demand.

One embodiment of the present invention includes two personal information change options that a biller may specify in the UBF:

Biller allows electronic change of a customer's personal information.

15 Biller does not allow electronic change of a customer's personal information.

One embodiment of the present invention includes three confirmation of invoice delivery options that a biller may specify in the UBF:

20 Biller supports option for all customers.

Biller supports option for specified customers only.

Biller does not support option.

If the biller supports a confirmation of invoice delivery for a customer, the CFI/SP is required to confirm to the biller each invoice delivery to a customer.

25 Figure 2 is a block diagram of the process used to add a new biller to the UBF in one embodiment of the present invention. As shown in Figure 2, the

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process begins when the biller fills out a biller questionnaire at block 200. The biller files the questionnaire with the biller bank at block 210, and the biller bank conveys the biller data contained in the biller questionnaire to the system manager at block 220. The system manager adds the new biller data to the UBF at block 230, and distributes the updated UBF to the CFI/SP's at block 240. The distribution at block 240 may occur at regular intervals, or whenever the system manager believes the amount of changes made to the UBF warrants distribution of an updated version of the UBF.

10 In addition to the UBF, other components of the electronic invoice presentation (EIP) system of the present invention include a set of control and maintenance transactions, and an invoice delivery system.

15 The set of control and maintenance transactions allows CFI/SP's and billers to control and maintain the EIP service. The transactions occur according to a set of pre-defined rules. These rules ensure that the EIP service performs with certainty and flexibility. The transactions control such functions as service activation, service deactivation, and maintenance of the service structure.

20 Figures 3 and 4 illustrate a customer service request transaction of one embodiment of the present invention. A customer service request includes any request from a customer related to the EIP system. Examples of customer service requests in one embodiment of the invention include:

- 25
- A customer activation request
 - A customer request for a change in type of invoice.
 - A request to change a customer's personal information.
 - A customer request to deactivate service.

A request to change the invoice destination node.

A customer request to change a paper invoice delivery option.

A customer request for a replacement invoice.

A customer request for a paper copy of an invoice.

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As shown in Figures 3 and 4, a customer service request transaction originates when a customer 140 conveys a request for service to CFI/SP 130. This step is indicated by the number 1 in Figure 3 and as block 400 in Figure 4. CFI/SP 130 formats the request in the manner required by transport network 120 and transmits it via transport network 120 to system manager 150. This step is indicated by numbers 2 and 3 in Figure 3 and block 410 in Figure 4. As shown in Figure 4, after receiving the request, system manager 150 checks to see if the request is proper at block 430. A proper request is one that is properly formatted, that comes from a participant CFI/SP, that relates to a participant biller, and that requests a type of service that the biller provides.

15

If the request is not a proper request, system manger 150 sends CFI/SP 130 an error message at block 440.

20

If the request is proper, system manager 150 sends the request to biller bank 110 via transport network 120 at block 450. This step is also indicated by numbers 4 and 5 in Figure 3. Biller bank 110 in turn conveys the request to biller 100. This step is indicated by number 6 in Figure 3 and block 460 in Figure 4.

25

The method steps shown in 4 apply generally to any customer service request transaction. For specific types of transactions, the method steps may include transaction-specific details.

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Figure 5 is a block diagram illustrating a customer activation request transaction for one embodiment of the present invention. As shown in Figure 5, a customer initiates activation of an electronic invoice presentation service from a specified biller by sending the customer's CFI/SP a request for activation of EIP service at block 500. The request specifies the biller with whom the customer wishes to activate service, the customer's account number with the biller, and the invoice delivery option the customer wishes to receive. After the customer's CFI/SP receives the customer's request for EIP service activation, the CFI/SP formats the request for transmission via the secure transport network to the system manager. In one embodiment, the format used is the "VIP SMS" format. In another embodiment, the format used is the "BASE II TC50" format. In one embodiment, the information contained in the request for service activation transmitted to the system manager by the CFI/SP includes:

- Invoice type.
- Invoice destination node.
- Paper invoice option.
- Delivery method (Type II or III only)
- PIN/password (Type III only)
- Device type.

The invoice type indicates which type of invoice delivery will be used. In this embodiment, the invoice types are Type I, Type II, and Type III as described with respect to Figures 6-10. The invoice type selected must be an invoice type supported by the applicable biller.

The invoice destination node is the node that will hold the invoice for presentation to the customer. For Types I and II, the invoice destination node is the customer's certified CFI/SP. For Type III, the invoice destination node is the system manager.

5

The paper invoice option indicates which paper invoice delivery option the customer desires. The paper invoice option selected must be an option that is supported by the biller.

10

The delivery method indicates whether the customer wishes to receive summary invoice data, a detailed invoice, or both. This information is only needed if the invoice type is Type II or Type III. For Type I there is no choice, only summary invoice data is available.

15

The PIN/password entry specifies the PIN and or password that the customer will use to obtain an invoice from the system manager. This entry is only used for Type III invoice delivery.

20 The device type entry indicates which device type, conforming or non-conforming, will be used by the customer to display electronic invoices.

25 As shown in Figure 5, the CFI/SP formats the service request and sends it via the transport network to the system manager at block 510. The system manager receives the request and checks it for form and content at block 520. For example, the system manager checks that the request is formatted in the proper format required to transmit it via the transport network, checks to make sure the biller specified is a participant in the EIP system, and compares the

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service options specified in the request to the service options supported by the biller as specified in the UBF.

5 If the request is found to be improper at block 530, the system manager sends the CFI/SP an error message at block 540. An example of an improper request is a request for a service option not supported by the applicable biller.

10 If the request is found to be proper at block 530, the system manager sends the request on to the biller bank, via the transport network, at block 550. The biller bank conveys the request to the biller at block 560. The biller updates the biller's database to reflect activation of service by the customer, and stores the customer's service preferences at block 570. The biller sends a confirmation of receipt of the service activation request to the CFI/SP, via the biller bank and transport network, at block 580.

15 Figure 11 is a block diagram illustrating a customer change in type of invoice request transaction for one embodiment of the present invention. This type of transaction is available only if the biller supports the new type of invoice the customer is requesting. As shown in Figure 11, this type of transaction
20 begins when a customer conveys a request for a change in the invoice type delivered by a particular biller to the customer's CFI/SP at block 1100. The CFI/SP formats the request (for example as a VIP SMS formatted or BASE II TC50 formatted transaction) and sends it via the transport network to the system manager at block 1110. The system manager checks the request for proper form
25 and content (including biller support of the invoice type requested) at block 1120. If the system manager finds the request improper at block 1130, the system manager sends the CFI/SP an error message at block 1140. If the request is

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proper, the system manager sends the request via the transport network to the biller bank at block 1150. The biller bank conveys the request to the biller at block 1160. In one embodiment, the biller bank is required to convey the request to the biller within two days of receipt. The biller updates the biller's database
5 with the customer's new preference at block 1170, and sends a confirmation via the transport network to the CFI/SP at block 1180.

Figure 12 is a block diagram illustrating a customer change personal information request transaction for one embodiment of the present invention.
10 This type of transaction is available only if the biller supports the option of allowing changes in a customer's personal information by electronic means. As shown in Figure 12, this type of transaction begins when a customer conveys a request for a change in personal information to the customer's CFI/SP at block 1200. The CFI/SP formats the request (for example as a VIP SMS formatted or
15 BASE II TC50 formatted transaction) and sends it via the transport network to the system manager at block 1210. The request includes, as applicable, the former and present values of the customer billing address, the customer last name, and the customer phone number. The system manager checks the request for proper form and content, including checking whether the biller supports
20 electronic changes in customer personal information, at block 1220. If the system manager finds the request improper at block 1230, the system manager sends the CFI/SP an error message at block 1240. If the request is proper, the system manager sends the request via the transport network to the biller bank at block 1250. The biller bank conveys the request to the biller at block 1260. In one
25 embodiment, the biller bank is required to convey the request to the biller within two days of receipt. The biller updates the biller's database with the customer's

new personal information at block 1270, and sends a confirmation via the transport network to the CFI/SP at block 1280.

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Figure 13 is a block diagram illustrating a customer request for deactivation of service for one embodiment of the present invention. A customer may request this type of transaction, for example, if the customer is terminating service with a specific biller or with a CFI/SP. As shown in Figure 13, this type of transaction begins when a customer conveys a request for deactivation of service to the customer's CFI/SP at block 1300. The CFI/SP formats the request (for example as a VIP SMS formatted or BASE II TC50 formatted transaction) and sends it via the transport network to the system manager at block 1310. The system manager checks the request for proper form and content at block 1320. If the system manager finds the request improper at block 1330, the system manager sends the CFI/SP an error message at block 1340. If the request is proper, the system manager sends the request via the transport network to the biller bank at block 1350. The biller bank conveys the request to the biller at block 1360. In one embodiment, the biller bank is required to convey the request to the biller within two days of receipt. The biller deactivates the customer from the biller's EIP service at block 1370, and sends a confirmation via the transport network to the CFI/SP at block 1380.

Figure 14 is a block diagram illustrating a request for changing the invoice destination node for one embodiment of the present invention. A CFI/SP may request this type of transaction, for example, when the CFI/SP changes the invoice destination node internally. This may occur, for example, when the customer switches from one delivery device (e.g. a touch-tone phone) to another delivery device (e.g. a personal computer). As shown in Figure 14,

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5 this type of transaction begins when a CFI/SP generates a request for a change of destination node, formats the request (for example as a VIP SMS formatted or BASE II TC50 formatted transaction) and sends it via the transport network to the system manager at block 1410. The system manager checks the request for proper form and content at block 1420. If the system manager finds the request improper at block 1430, the system manager sends the CFI/SP an error message at block 1440. If the request is proper, the system manager sends the request via the transport network to the biller bank at block 1450. The biller bank conveys the request to the biller at block 1460. In one embodiment, the biller bank is required to convey the request to the biller within two days of receipt. The biller updates the biller's database to reflect the new invoice destination node at block 1470, and sends a confirmation via the transport network to the CFI/SP at block 1480.

15 Figure 15 is a block diagram illustrating a customer change paper invoice delivery option request transaction for one embodiment of the present invention. This type of transaction is available only if the biller supports the paper invoice delivery option to which the customer wishes to change. As shown in Figure 15, this type of transaction begins when a customer conveys a request for a change in paper invoice delivery option to the customer's CFI/SP at block 1500. The CFI/SP formats the request (for example as a VIP SMS formatted or BASE II TC50 formatted transaction) and sends it via the transport network to the system manager at block 1510. The system manager checks the request for proper form and content, including checking whether the biller supports the new paper invoice delivery option, at block 1520. If the system manager finds the request improper at block 1530, the system manager sends the CFI/SP an error message at block 1540. If the request is proper, the system manager sends the request via

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the transport network to the biller bank at block 1550. The biller bank conveys the request to the biller at block 1560. In one embodiment, the biller bank is required to convey the request to the biller within two days of receipt. The biller updates the biller's database with the customer's new paper invoice delivery preference at block 1570, and sends a confirmation via the transport network to the CFI/SP at block 1580.

Figure 16 is a block diagram illustrating a customer request for Type I or Type II replacement invoice transaction for one embodiment of the present invention. A customer may make such a request, for example, if the customer has lost or damaged the original invoice and needs another copy. In one embodiment of the present invention, for Type I and Type II invoice delivery, the CFI/SP is required to store copies of electronic invoices for a specified period of time after delivery to the customer. In one embodiment, this period of time is one billing cycle. As shown in Figure 16, this type of transaction begins when a customer requests a replacement invoice from the customer's CFI/SP at block 1600. In the request, the customer includes a unique invoice ID that identifies the invoice for which the customer wishes to receive a replacement. The CFI/SP retrieves the invoice identified by the unique invoice ID and delivers a replacement copy to the customer at block 1610.

Figure 17 is a block diagram illustrating a customer request for Type III replacement invoice transaction for one embodiment of the present invention. In one embodiment of the present invention, for Type III invoice delivery, the system manager stores copies of electronic invoices for a specified period of time after delivery to the customer. In one embodiment, this period of time is

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one billing cycle. As shown in Figure 17, this type of transaction begins when a customer requests a replacement invoice from the system manager at block 1700. In the request, the customer includes a unique invoice ID that identifies the invoice for which the customer wishes to receive a replacement as well as the customer's PIN and/or password. The system manager verifies the PIN and/or password of the customer, and retrieves the invoice identified by the unique invoice ID and delivers a replacement copy to the customer at block 1710.

Figure 18 is a block diagram illustrating a customer request for a paper copy of an invoice transaction for one embodiment of the present invention. This type of transaction is available only if supported by the biller. A customer may request a paper copy of a bill if the customer needs more detail than provided by a summary invoice or if the customer needs an invoice for receipt purposes. As shown in Figure 18, this type of transaction begins when a customer conveys a request for a paper copy of a specific biller's invoice to the customer's CFI/SP at block 1800. The request includes a unique invoice identification number. In one embodiment of the invention, the request must be made within two billing cycles of the original invoice date. The CFI/SP formats the request (for example as a VIP SMS formatted or BASE II TC50 formatted transaction) and sends it via the transport network to the system manager at block 1810. The system manager checks the request for proper form and content, including checking whether the biller supports paper invoice delivery, at block 1820. If the system manager finds the request improper at block 1830, the system manager sends the CFI/SP an error message at block 1840. If the request is proper, the system manager sends the request via the transport network to the biller bank at block 1850. The biller bank conveys the request to the biller at block 1860. In one embodiment, the biller bank is required to convey the request

to the biller within two days of receipt. The biller produces the paper bill and sends it to the customer at block 1870, and sends a confirmation via the transport network to the CFI/SP at block 1880. In one embodiment of the invention, the biller may impose permanent delivery of paper bills, instead of electronic bills, if
5 a customer frequently requests paper copies of invoices.

In one embodiment of the present invention, biller request/confirmation control and maintenance transaction types include:

- 10 Biller confirmation of service request.
- Biller notification of change in UBF option.
- Biller deactivation of a customer account.

Figure 19 is a block diagram illustrating a biller confirmation of a customer service request transaction for one embodiment of the present
15 invention. In one embodiment of the present invention, biller confirmation is mandatory for the following service requests:

- Customer activation of service.
- Invoice Type change.
- Change in customer personal information.
- 20 Customer request for a paper copy of invoice.
- Change in paper invoice delivery option.
- Change of invoice destination node.
- Customer requested deactivation.

25 As shown in Figure 19, this type of transaction begins when a biller receives a request for service at block 1900. The biller sends a record to the biller bank confirming the information contained in the service request at block 1910. The

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confirmation includes particulars of the service requested. The biller bank formats the confirmation (for example as a BASE II TC50 formatted transaction) and sends it via the transport network to the system manager at block 1920. In one embodiment of the invention, the biller bank must send the confirmation to the system manager within five days of receiving the original service request from the system manager. The system manager checks the confirmation for proper form and sends the confirmation via the transport network to the customer's CFI/SP at block 1930. The customer's CFI/SP conveys the confirmation to the customer at block 1940. In one embodiment, the CFI/SP need not convey the confirmation to the customer if the service request was for a change in invoice destination node or a customer requested deactivation.

Figure 20 is a block diagram illustrating a biller notification of change in UBF option transaction for one embodiment of the present invention. As shown in Figure 20, this type of transaction begins when a biller changes one or more UBF options at block 2000. The biller generates a change in UBF options notice for each affected customer and sends the notice to the biller bank at block 2010. The notice includes particulars of the UBF option change. The biller bank formats the notice (for example as a BASE II TC50 formatted transaction) and sends it via the transport network to the system manager at block 2020. In one embodiment of the invention, the biller bank must send the notice to the system manager within two days of receiving the notice from the biller. The system manager checks the notice for proper form and sends the notice via the transport network to the customer's CFI/SP at block 2030. The customer's CFI/SP conveys the notice to the customer at block 2040. In one embodiment, the CFI/SP must convey the notice to the customer within one day after receiving it.

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Figure 21 is a block diagram illustrating a biller deactivation of customer account transaction for one embodiment of the present invention. A biller may deactivate a customer's account if the customer terminates its relationship with the biller (e.g. the customer pays off a loan), if the biller ceases to provide the service the customer was receiving, if the customer abuses electronic invoicing, or for some other reason. As shown in Figure 21, this type of transaction begins when a biller generates a notice of deactivation of a customer's account at block 2100. In one embodiment of the present invention, the deactivation notice must be sent by the biller to the biller bank within 1 day after a customer termination. In one embodiment, the notice must include the reasons for the deactivation. The biller bank formats the deactivation notice (for example as a BASE II TC50 formatted transaction) and sends it via the transport network to the system manager at block 2110. In one embodiment of the invention, the biller bank must send the deactivation notice to the system manager within two days of receiving the notice from the biller. The system manager checks the notice for proper form and sends the notice via the transport network to the customer's CFI/SP at block 2120. The customer's CFI/SP updates its database to reflect the customer deactivation at block 2130, and conveys the deactivation notice to the customer at block 2140. In one embodiment, the CFI/SP must convey the notice to the customer within one day after receiving it.

In one embodiment of the present invention, CFI/SP notification control and maintenance transaction types include:

- CFI/SP invoice undeliverable notification to biller.
- CFI/SP invoice non-delivery notification to biller (Types I and II).
- System manager invoice non-delivery notification to biller (Type III).
- CFI/SP positive invoice delivery confirmation to biller (Types I and II).

System manager positive invoice delivery confirmation to biller (Type III).

Figure 22 is a block diagram illustrating a CFI/SP invoice undeliverable notification to biller transaction for one embodiment of the present invention.

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- 5 Such a notification arises when a CFI/SP receives an invoice that it cannot deliver to a customer, because, for example, the customer is not on file with the CFI/SP. The biller therefore must be notified that the invoice has been sent to a wrong destination. As shown in Figure 22, this type of transaction begins when a CFI/SP receives an invoice that it cannot deliver at block 2200. The CFI/SP
- 10 generates an invoice undeliverable notification at block 2210. The notification includes the reason why the invoice is undeliverable. The CFI/SP formats the notification (for example as a VIP SMS or BASE II TC50 formatted transaction) and, sends it via the transport network to the system manager at block 2220. In one embodiment of the invention, the CFI/SP must send the undeliverable
- 15 notification to the system manager within one day after the CFI/SP discovers that the invoice is undeliverable. The system manager checks the notification for proper form, including insuring that the biller to whom it is addressed is a participant in the EIP system, at block 2222. If the notification is not of proper form, the system manager sends the CFI/SP an error message at block 2225. If
- 20 the notification is of proper form, the system manager checks if the notification relates to a Type III invoice delivery option at block 2230. If the notification relates to a Type III invoice delivery option, the system manager deletes the undeliverable invoice from its invoice storage at block 2240. The system manager sends the notification via the transport network to the biller bank at
- 25 block 2250. The biller bank conveys the undeliverable notification to the biller at block 2260. In one embodiment, the biller bank must convey the notification to

the biller within two days after receiving it. The biller updates its database with the undeliverable status of the invoice at block 2270.

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Figure 23 is a block diagram illustrating a CFI/SP notification of invoice non-delivery transaction for Type I and Type II invoice delivery for one embodiment of the present invention. For Type I and Type II invoice delivery, the customer's certified CFI/SP is responsible for delivery of the invoice to a customer. A CFI/SP sends a notification of invoice non-delivery to a biller if the invoice due date has passed without the customer receiving the invoice. The customer may not have received the invoice because, for example, the customer did not access the device over which the invoice is delivered to the customer. As shown in Figure 23, this type of transaction begins when an invoice delivery date passes without the invoice having been delivered to the customer at block 2300. The customer's CFI/SP generates an invoice non-delivery notification at block 2310. The CFI/SP formats the notification (for example as a VIP SMS or BASE II TC50 formatted transaction) and sends it via the transport network to the system manager at block 2320. In one embodiment of the invention, the CFI/SP must send the invoice not delivered notification to the system manager within one day after the invoice due date. The system manager checks the notification for proper form, including insuring that the biller to whom it is addressed is a participant in the EIP system, at block 2330. If the notification is not of proper form, the system manager sends the CFI/SP an error message at block 2340. If the notification is of proper form, the system manager sends the notification via the transport network to the biller bank at block 2350. The biller bank conveys the non-delivery notification to the biller at block 2360. In one embodiment, the biller bank must convey the notification to the biller within two

days after receiving it. The biller updates its database with the invoice non-delivery (or bill not read) status at block 2370.

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5 invoice non-delivery transaction for Type III invoice delivery for one embodiment of the present invention. For Type III invoice delivery, the customer's non-certified CFI/SP delivers a notice of waiting invoice to the customer, but the system manager is responsible for delivery of the invoice to the customer. The system manager sends a notification of invoice non-delivery to a biller if the invoice due date has passed without the customer receiving the invoice. The customer may not have received the invoice because, for example, the customer did not access the device over which the invoice is delivered to the customer. As shown in Figure 24, this type of transaction begins when an invoice delivery date passes without the invoice having been delivered to the customer at block 2400. The system manager generates an invoice non-delivery notification at block 2410. The system manager formats the notification (for example as a VIP SMS or BASE II TC50 formatted transaction) and sends it via the transport network to the biller bank at block 2420. In one embodiment of the invention, the system manager must send the invoice not delivered notification to the biller bank within one day after the invoice due date. The biller bank conveys the non-delivery notification to the biller at block 2430. In one embodiment, the biller bank must convey the notification to the biller within two days after receiving it. The biller updates its database with the invoice non-delivery (or bill not read) status at block 2440.

25 Figure 25 is a block diagram illustrating a CFI/SP positive confirmation of invoice delivery transaction for Type I and Type II invoice delivery for one

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embodiment of the present invention. A biller may request a CFI/SP to provide confirmation of delivery to allow the biller to determine when the customer has received an invoice. The biller may make a blanket request that a CFI/SP provide confirmation of delivery for all invoices by specifying a confirmation of delivery option in the biller's entry in the UBF. Alternatively, if the biller wishes confirmation of delivery for a specific invoice only, the biller may include a request for confirmation in the invoice itself when it is sent to the CFI/SP. The responsible CFI/SP sends a positive confirmation of invoice delivery to a biller when the customer has downloaded the invoice to a delivery device. As shown in Figure 25, this type of transaction begins when an invoice is delivered to the customer's delivery device at block 2500. The customer's CFI/SP generates an confirmation of delivery notification at block 2510. The confirmation includes the date on which the customer received the invoice. The CFI/SP formats the notification (for example as a VIP SMS or BASE II TC50 formatted transaction) and sends it via the transport network to the system manager at block 2520. In one embodiment of the invention, the CFI/SP must send the notification to the system manager within one day after delivery of the invoice to the customer. The system manager checks the notification for proper form, including insuring that the biller to whom it is addressed is a participant in the EIP system, at block 2530. If the notification is not of proper form, the system manager sends the CFI/SP an error message at block 2540. If the notification is of proper form, the system manager sends the notification via the transport network to the biller bank at block 2550. The biller bank conveys the delivery notification to the biller at block 2560. In one embodiment, the biller bank must convey the notification to the biller within two days after receiving it. The biller updates its database with the invoice delivered status at block 2570.

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Figure 26 is a block diagram illustrating a system manager positive confirmation of invoice delivery transaction for Type III invoice delivery for one embodiment of the present invention. A biller may request confirmation of delivery to allow the biller to determine when the customer has received an invoice. The biller may make a blanket request for confirmation of delivery for all invoices by specifying a confirmation of delivery option in the biller's entry in the UBF. Alternatively, if the biller wishes confirmation of delivery for a specific invoice only, the biller may include a request for confirmation in the invoice itself when it is sent to the system manager. The system manager sends a positive confirmation of invoice delivery to a biller when the customer has downloaded the invoice to a delivery device. As shown in Figure 26, this type of transaction begins when an invoice is delivered by the system manager to the customer's delivery device at block 2600. The system manager generates a confirmation of delivery notification at block 2610. The confirmation includes the date on which the customer received the invoice. The system manager formats the notification (for example as a VIP SMS or BASE II TC50 formatted transaction) and sends it via the transport network to the biller bank at block 2620. In one embodiment, the system manager must send the delivery notification to the biller bank within 1 day of delivery of the invoice to the customer. The biller bank conveys the delivery notification to the biller at block 2630. In one embodiment, the biller bank must convey the notification to the biller within two days after receiving it. The biller updates its database with the invoice delivered status at block 2640.

One embodiment of the present invention is described in Appendix 1. As stated in Appendix 1, this embodiment includes a category of participants referred to as "statement originators." Statement originators include billers that

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generate invoices, but also include other entities such as banks and stock brokers that provide periodic statements to customers that are not bills for services but that provide information to customers (such as bank account balances). Such non-biller statement originators may use the invoice delivery capabilities of the present invention to deliver electronic versions of their periodic customer statements in the same manner as billers use the invoice delivery capabilities of the present invention to deliver bills.

The embodiment described in Appendix 1 also includes options for including interactive fields in statements delivered to customers. These interactive fields allow the customer to request additional information by activating an interactive field. For example, a statement may include an interactive field consisting of an advertisement for a product or service provided by a third party. Activating this field, for example by positioning a cursor on the field and activating a mouse button, causes the retrieval of information about the product or service. In one embodiment, activating an interactive field creates a link to a web page on the World Wide Web.

Additional details of this embodiment are described in Appendix 1.

The present invention can be implemented by means of software programming on any of a variety of one or more computer systems as are well known in the art, including, without limitation, computer systems such as that shown in Figure 27. The computer system of Figure 27 may, for example, be used as a customer computer, a biller computer, a bank computer, or a system manager computer. The computer system shown in Figure 27 includes a CPU unit 2700 that includes a central processor, main memory, peripheral interfaces,

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input-output devices, power supply, and associated circuitry and devices; a display device 2710 which may be a cathode ray tube display, LCD display, gas-plasma display, or any other computer display; an input device 2730, which may include a keyboard, mouse, digitizer, or other input device. The computer
5 system may or may not include non-volatile storage 2720, which may include magnetic, optical, or other mass storage devices, and a printer 2750. The computer system may also include a network interface 2740, which may consist of a modem, allowing the computer system to communicate with other systems over a communications network. Any of a variety of other configurations of
10 computer systems may also be used.

Thus a novel system for electronic invoice presentation has been presented. Although the present invention has been described with respect to certain example embodiments, it will be apparent to those skilled in the art that
15 the present invention is not limited to these specific embodiments. For example, although the operation of certain embodiments has been described in detail using certain detailed process steps, some of the steps may be omitted or other similar steps may be substituted without departing from the scope of the invention. Further, although the invention has been described as utilizing the
20 VisaNet(TM) as a transport network, other networks or other communications media may be used.

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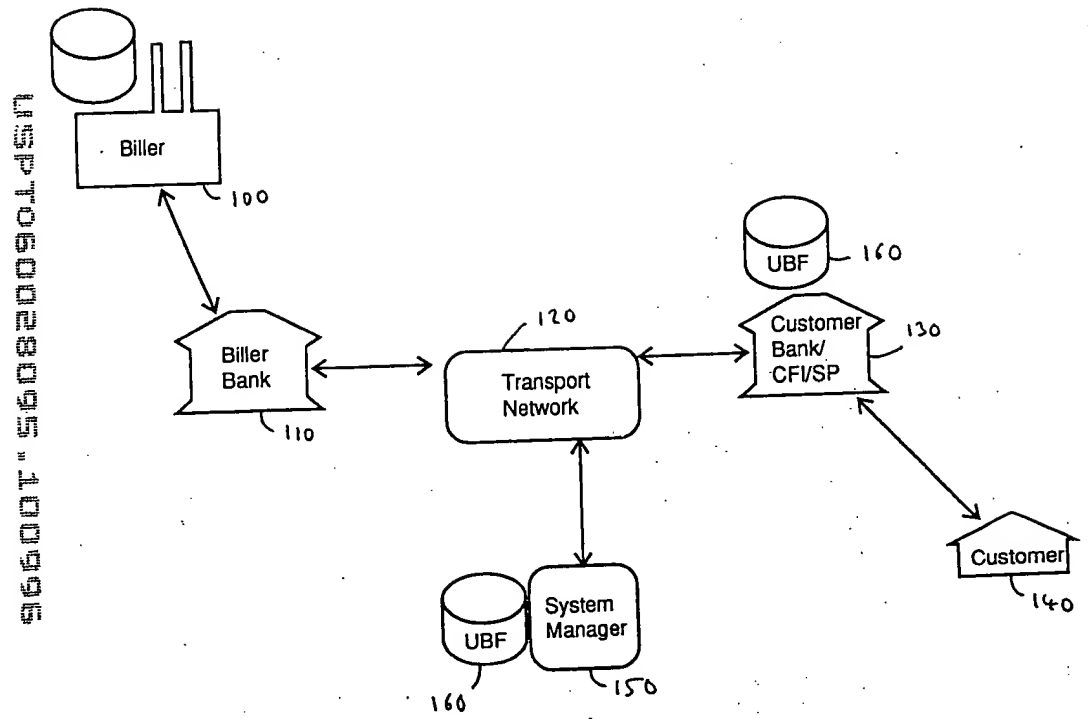
Appendix 1

95000.952

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Express Mail #EM300602468US

FIG. 1



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FIG. 2

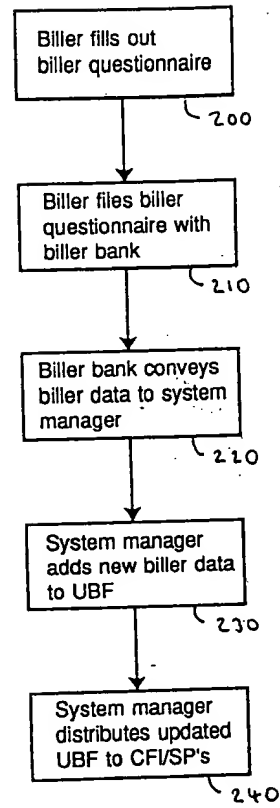
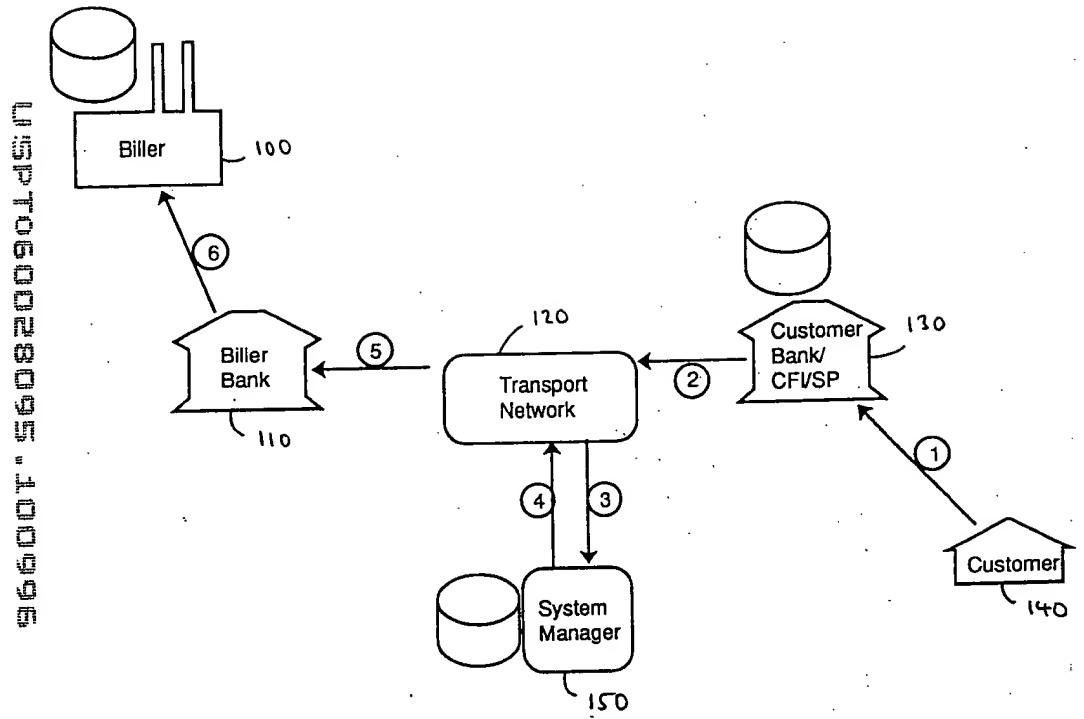


FIG. 3



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FIG. 4

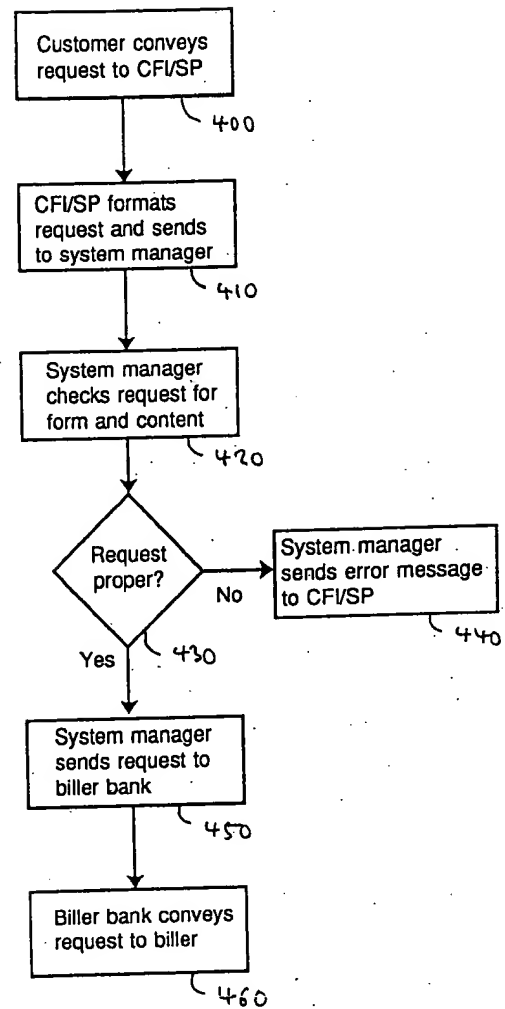


FIG. 5

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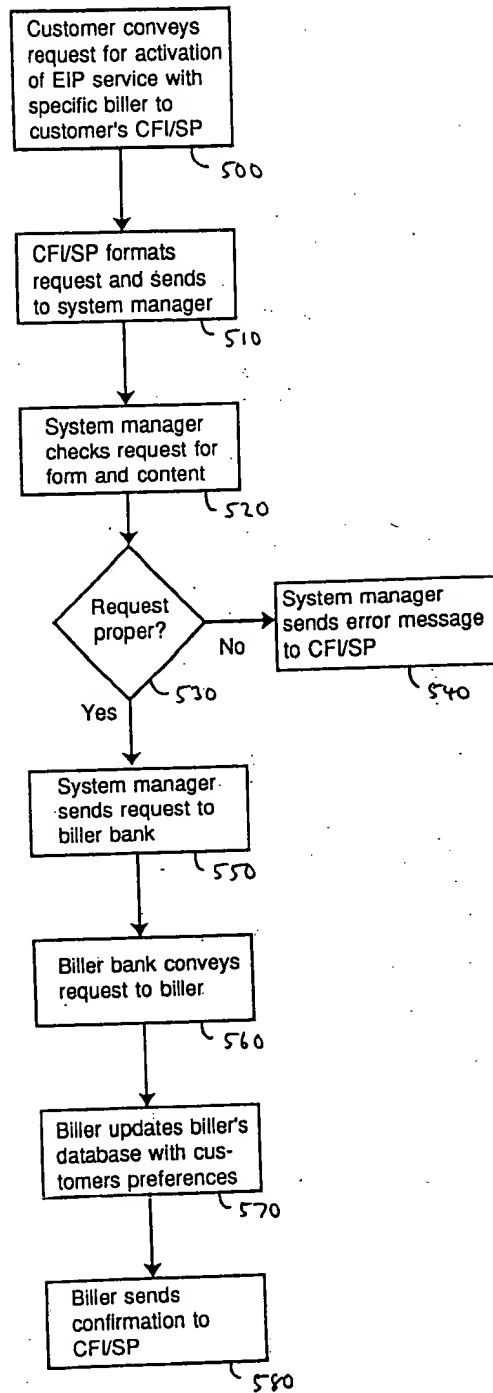


FIG. 6

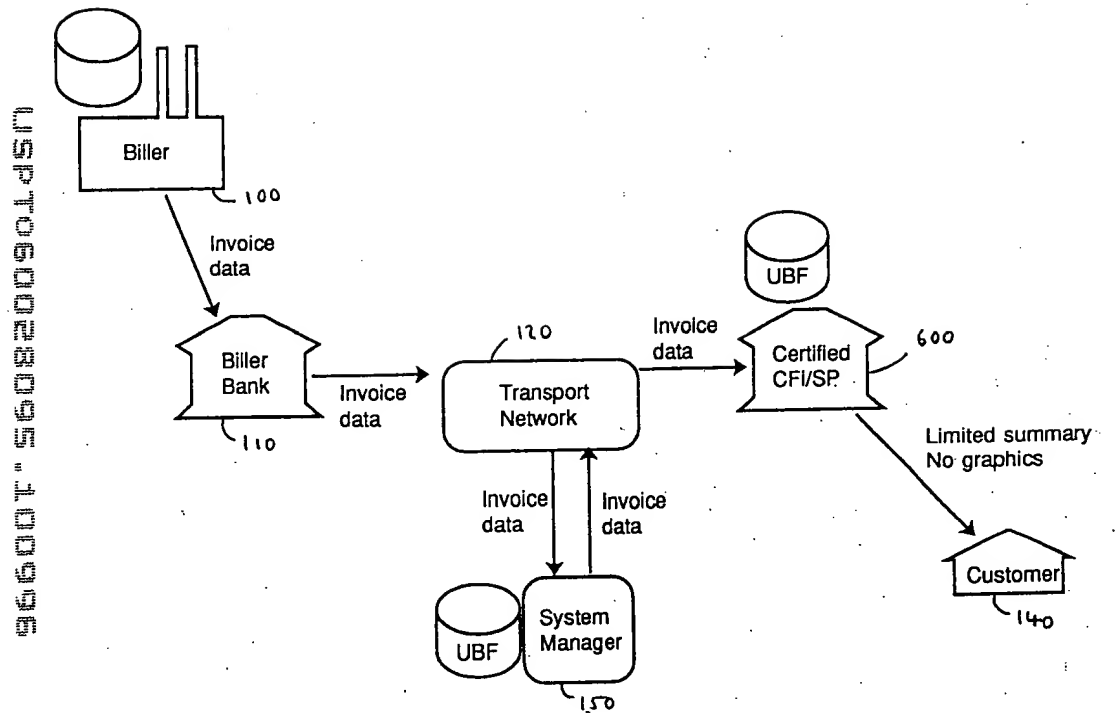


FIG. 7

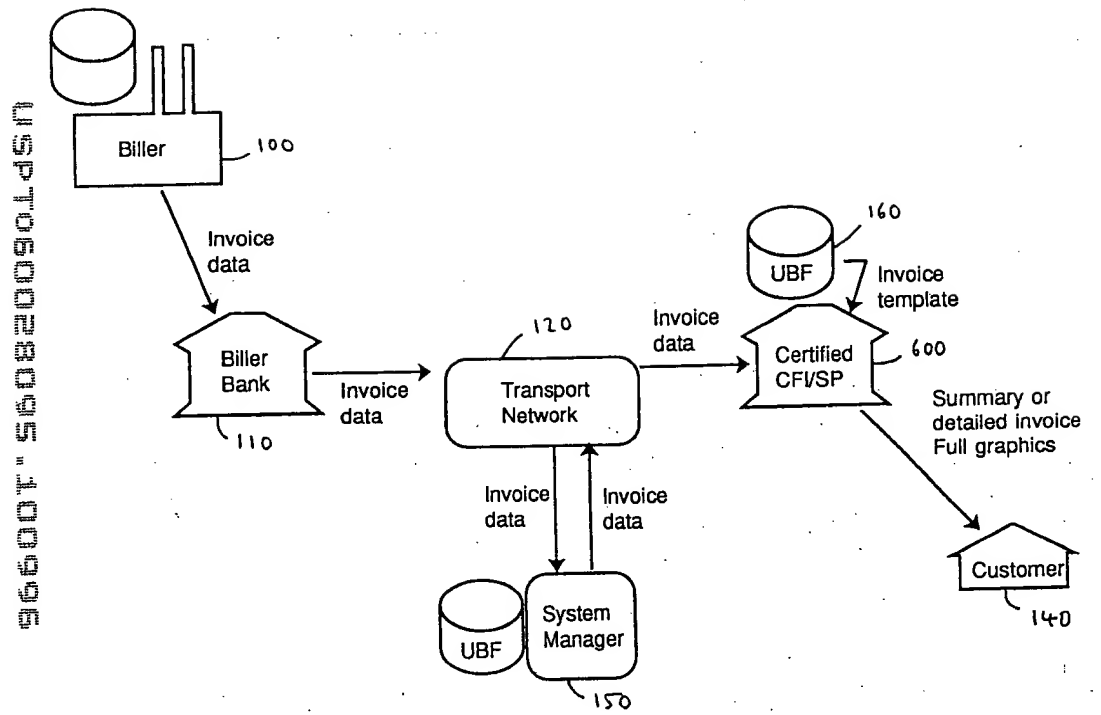
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700

COMMONSTATE ELECTRIC COMPANY 705

Customer Account No. 123-456-789 715 John R. Public 1234 Street Drive City, State ZipCode 725 Electricity Used: Feb. 24 reading: 43210 745 Jan. 24 reading: 42786 30-Day Billed Use: 00424 Current Charges: $424 \times \$0.11 = \46.64	<div style="text-align: right;">New Charges: \$46.64 Prev. Bill: \$43.21 Payment: \$43.21 Amount Due \$46.64 Billing Date: Feb. 28, 1999 Due Date: Mar 12, 1999</div> <div style="text-align: right;">735</div> <div style="text-align: right;">Send payment to: 755 Commonstate Electric Company 543 Main Street Big City, State ZipCode</div>
---	--

FIG. 8



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COMMONSTATE ELECTRIC COMPANY 705

Customer Account No. 123-456-789 715

John R. Public 725
1234 Street Drive
City, State ZipCode

Electricity Used:

Feb. 24 reading: 43210
Jan. 24 reading: 42786
30-Day Billed Use: 00424
745 Current Charges:

424 x \$0.11 = \$46.64

950

New Charges: \$46.64 715
Prev. Bill: \$43.21
Payment: \$43.21
Amount Due: \$46.64
Billing Date: Feb. 28, 1999
Due Date: Mar 12, 1999

Send payment to: 755
Commonstate Electric Company
543 Main Street
Big City, State ZipCode

910

☐ This year
☒ Last year

M A M J J A S O N D J F
Twelve Month Electricity Use

940

Special Offer for Commonstate Electric Customers!

Complete Spring Car Tune-up from
CAR MASTERS
Reg. \$99, Now \$59
Call 1-800-TUNEUPS

930

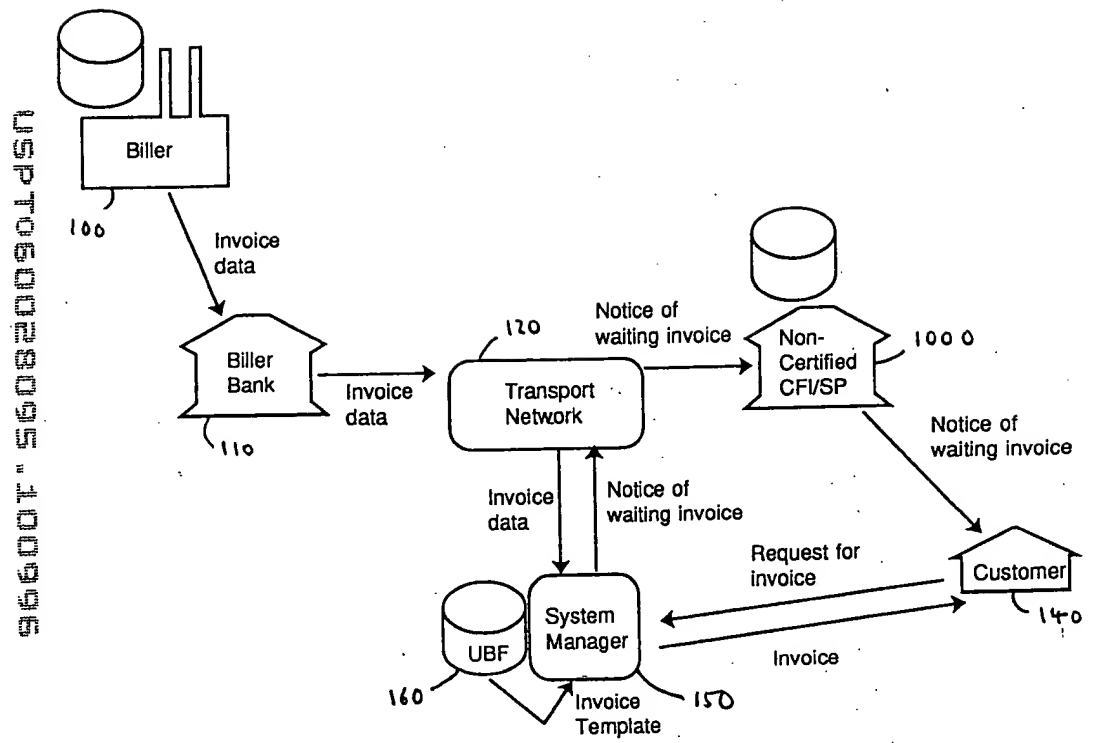
Cut your electricity use up to 25%!
Call your Commonstate customer
service representative for details.
Call 1-800-ELECTRIC 920

920

Got the Winter Blues?
Win a Hawaii Vacation for
Two! Call 1-800-NOBLUES

FIG. 9

FIG. 10



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FIG. 11

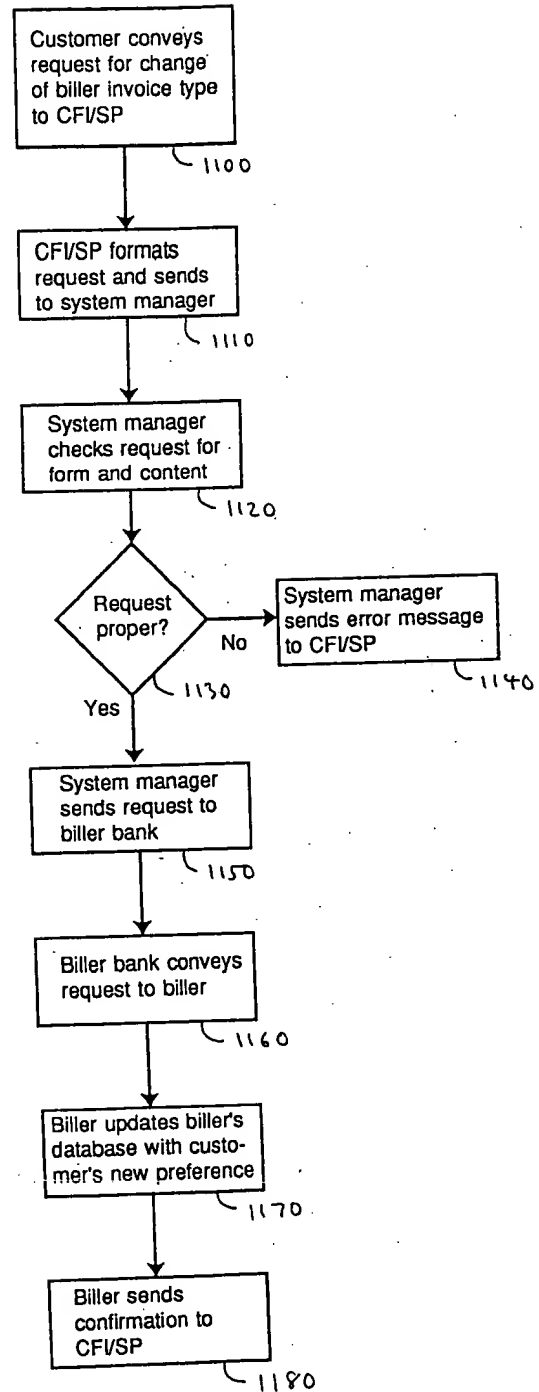


FIG. 12

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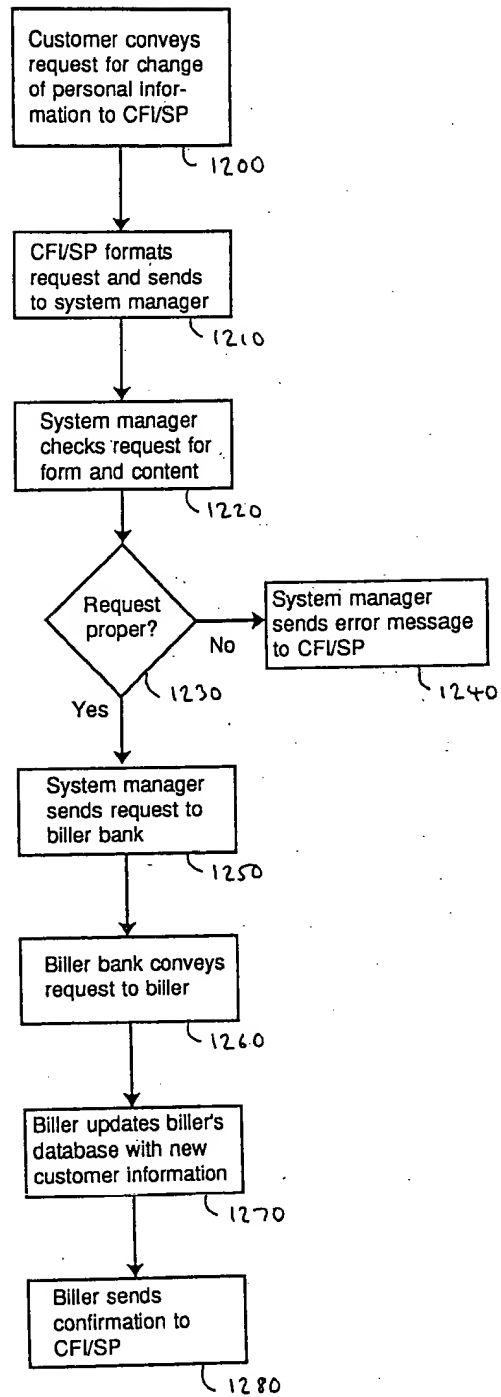
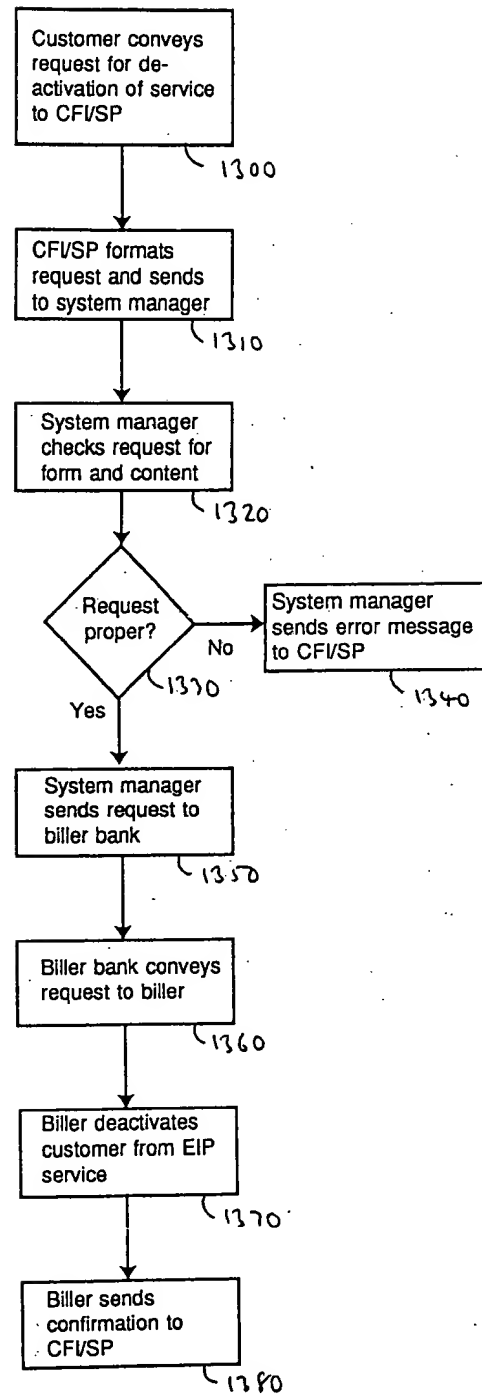
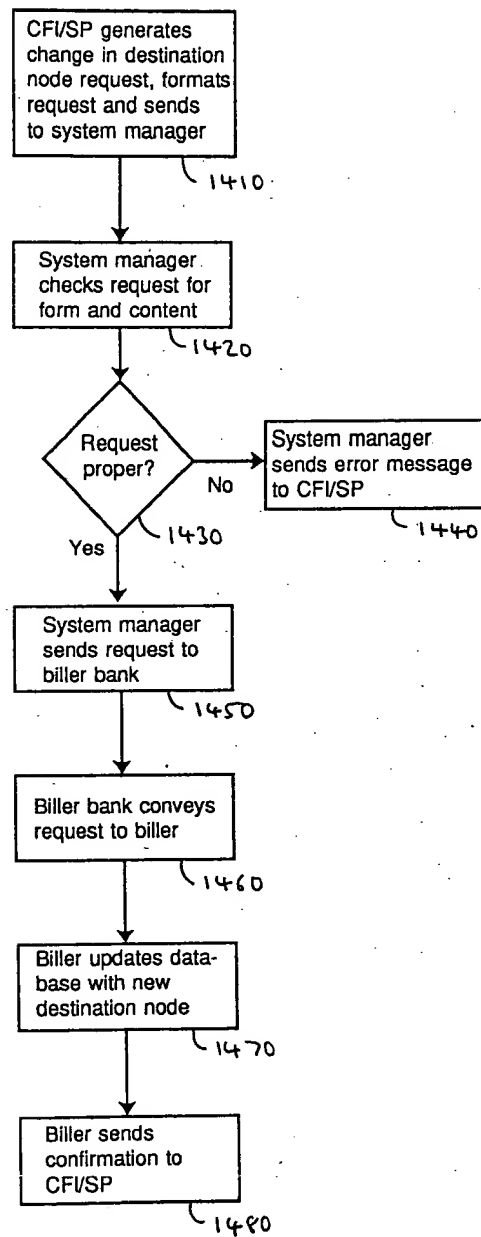


FIG. 13



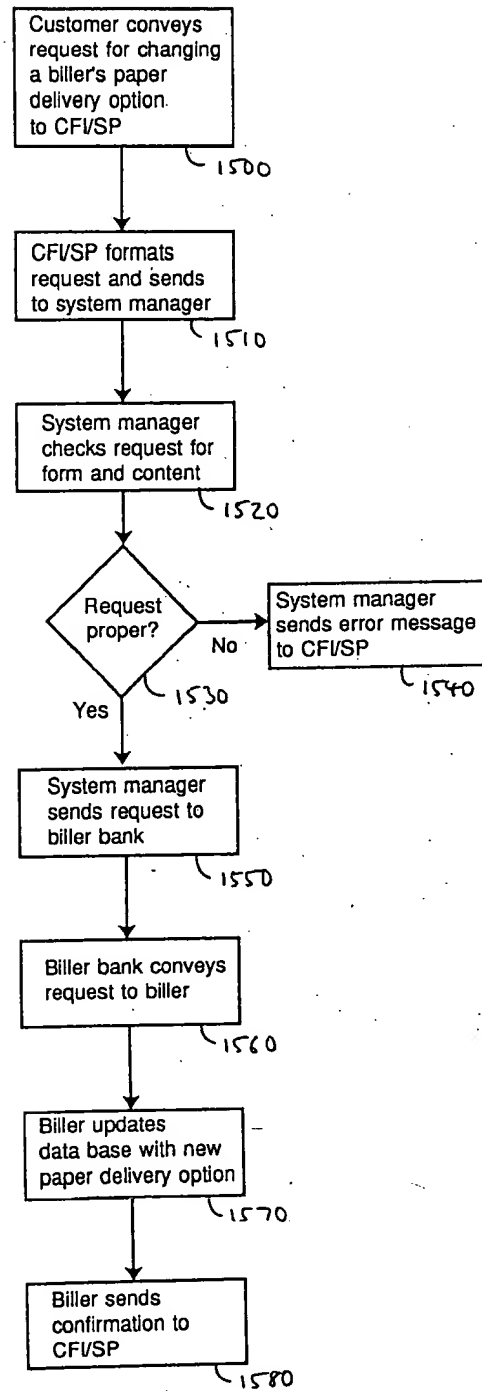
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FIG. 14



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FIG. 15



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FIG. 16

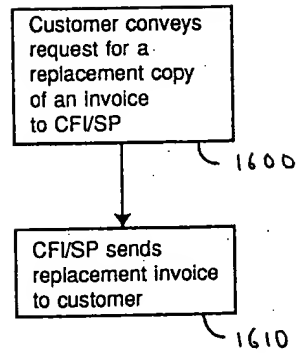


FIG. 17

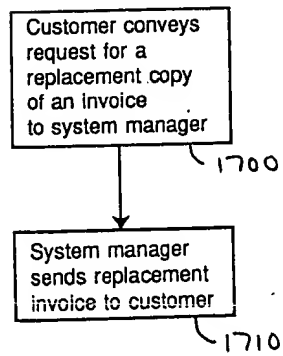
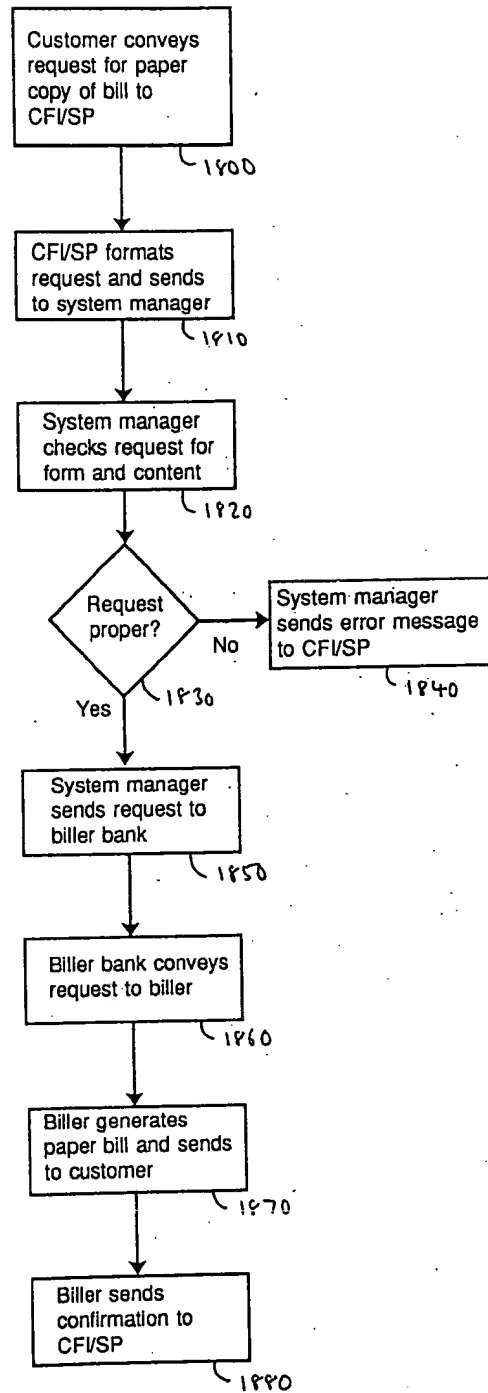


FIG. 18



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FIG. 19

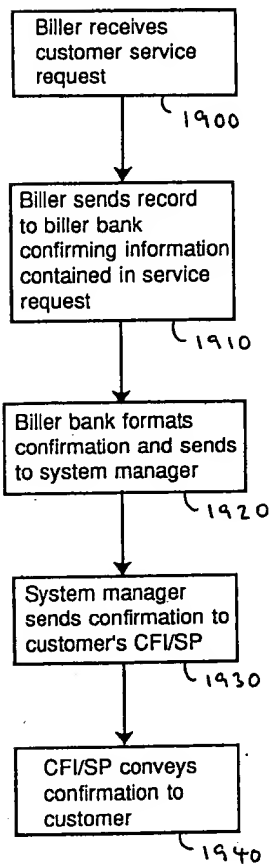
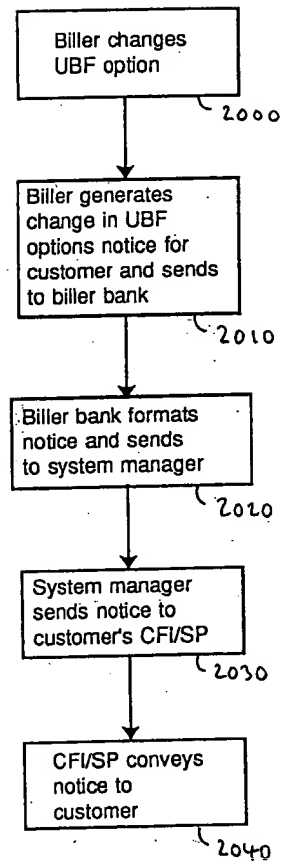


FIG. 20



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FIG. 21

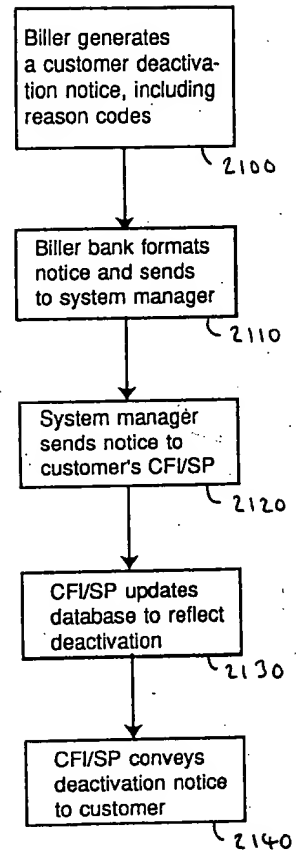
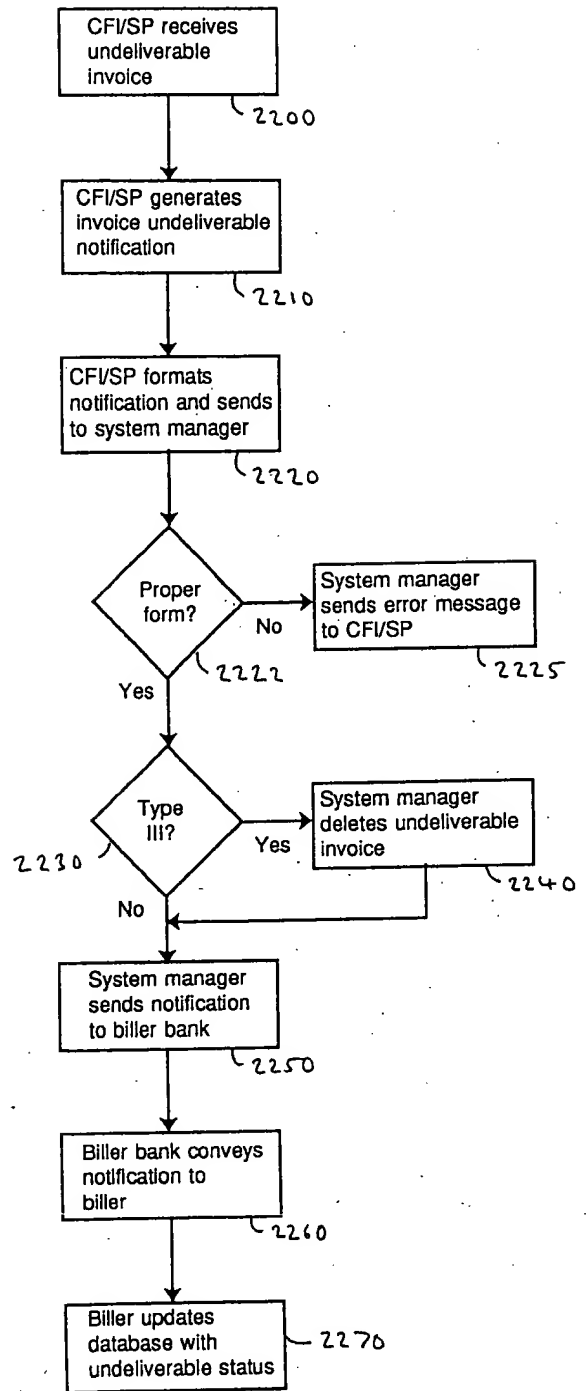
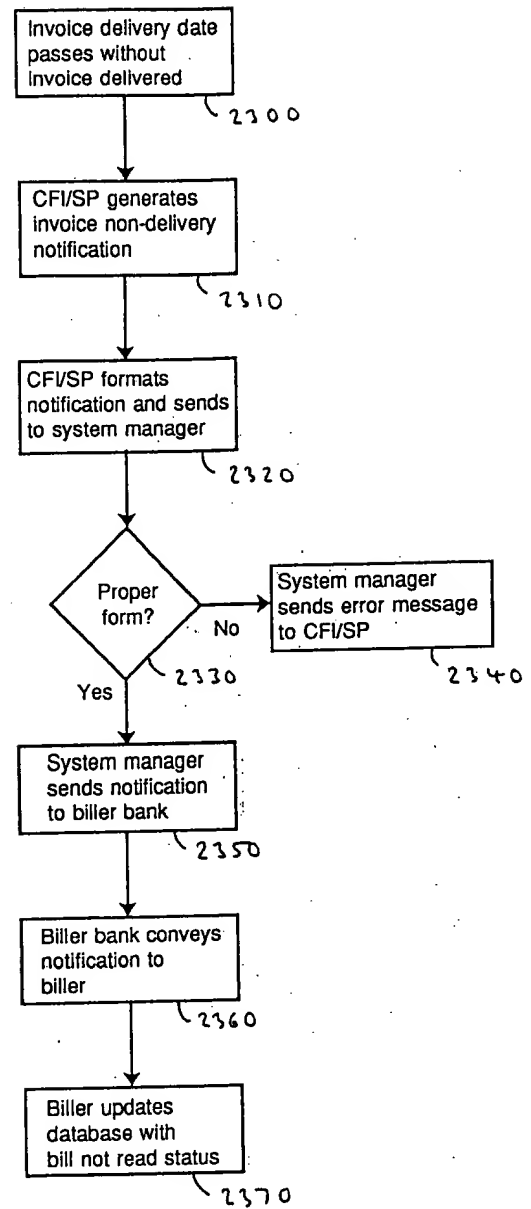


FIG. 22



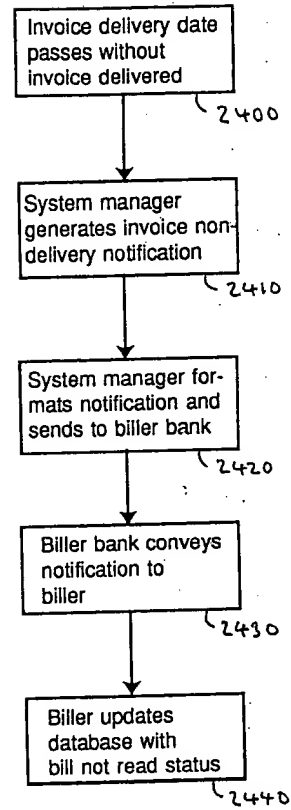
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FIG. 23



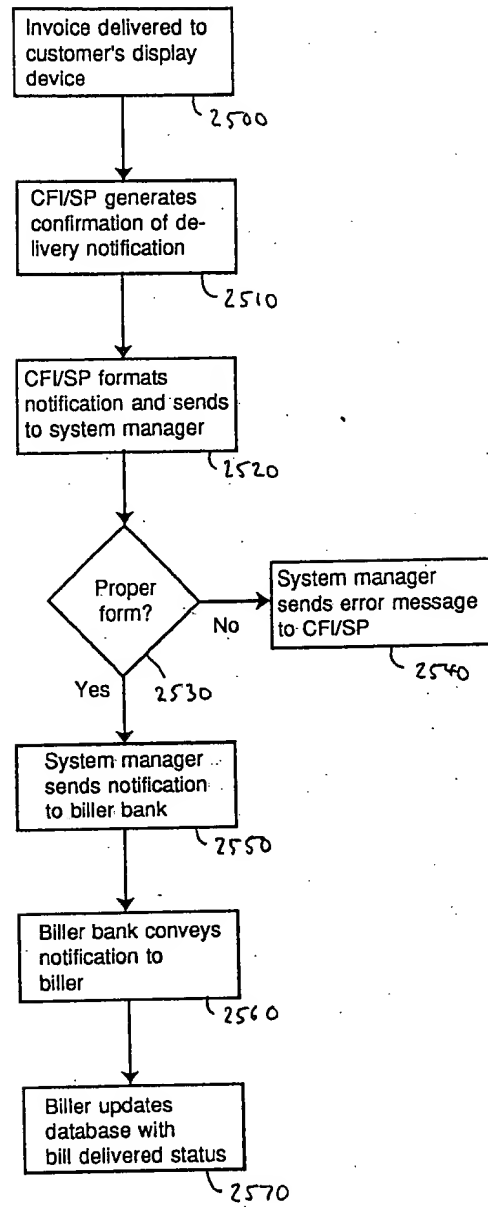
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FIG. 24



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FIG. 25



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FIG. 26

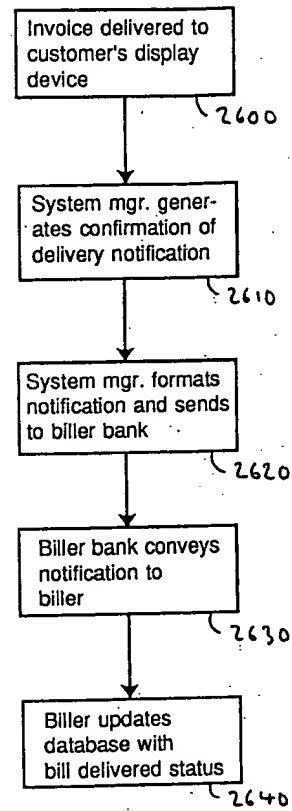
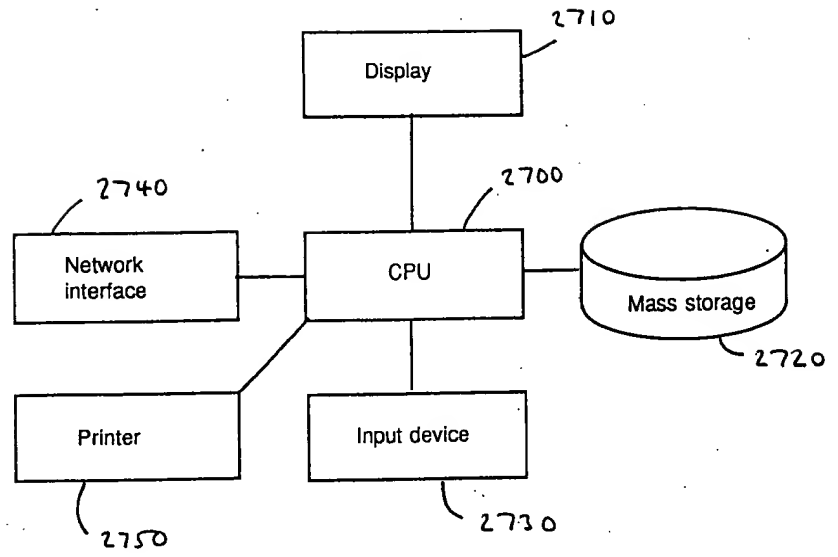


FIG. 27



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Electronic Statement Presentment (ESP)

System Architecture

Introduction

This document presents the planned system architecture for **Visa International's** (Visa's) **Electronic Statement Presentment System (ESP)**. *ESP* will represent a major extension of Visa's existing **Electronic Payments System (ePay)**.

A Phase I Pilot Program for ESP is scheduled to commence in early 1997.

Figure 11 - *Customer and Statement Originator ESP Architecture* on page 3 shows the major players and the types of data transferred through Visa's *ePay System*, as extended by the *ESP* project. Principal players (or roles) include:

- **Statement Originators.** Organizations that originate statements or bills, e.g., a bank issuing statements or a local business issuing monthly bills to its customers.
- **Billers.** A subset of *Statement Originators* that originate *Statements* having an amount that is due and payable.
- **Biller Financial Institution.** Financial institutions that serve *Billers* by receiving payments on their behalf sent through Visa's *ePay* system, and by sponsoring *Statement Originators* into the *ESP* System.
- **Statement Service Providers (SSP's).** Organizations that receive statement data from one or more *Statement Originators* and cause it to be delivered either via Visa's *ESP* system or otherwise (e.g., U.S. Mail). These may be financial institutions or other institutions sponsored by financial institutions.
- **Visa International.** The world's largest processor of credit card transactions. Visa develops, maintains and promotes the *Visa ESP Service*. This includes the *ESP* System, operating rules, standards, and related pricing.
- **Customer Financial Institution/Service Providers (CSP's).** Organizations that receive statement data from multiple *Statement Originators* via Visa's *ESP* System or otherwise and deliver these statements to *Customers* electronically.
- **Originating Banks.** Financial institutions that hold the accounts *Customers* use to pay *Statements*.
- **Customers.** *Statement* recipients. Examples of *Customers* include individuals like you and me, as well as businesses.

Some organizations may carry out multiple roles. For example, a financial institution may be both *Statement Originator* and *Customer Financial Institution*. Very large *Statement Originators* may function as their own *Statement Service Provider*. A financial institution may choose to become both a *Statement Originator* and a *Customer Financial Institution/Service Provider*.

Statement Originators must be sponsored into Visa's *ESP Service* by a *Biller Financial Institution* to participate. This usually entails a contract and payment of fees.

Visa will access fees for the *ESP Service* only to *Biller Financial Institutions* and *Customer Financial Institutions* participating in the service. These organizations determine fee structures and rates to *Statement Originators* and *Customers*.

For a description of the differences between the architecture described in Versions 1.1 and 1.2 of this document, see *Appendix A - What's New ?* on page 84.

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Overview

For a description of the differences between the architecture described in Versions 1.1 and 1.2 of this document, see *Appendix A - What's New ?* on page 84.

A. The System

1. Components

As shown in *Figure 11 - Customer and Statement Originator ESP Architecture* on page 3, the full ePay system consists of a *Payments* "layer", which is used to process electronic payments made by *Customers* to *Statement Originators*, and a *Statement* "layer" which is used by *Statement Originators* to present electronic versions of *Statements* to *Customers*. The flows of data in the *Payments* layer of the system are shown in dashed lines and are marked "Outside of ESP Project's Scope".

The *Payment* layer of ePay passes data for *Payments* from a *Customer's* PC to an *Originating Bank* which submits the *Payment* to Visa's *Base II* computer system. *Base II* settles the transaction and sends it to a *Biller Bank Workstation* (BBWS) at the *Biller's* *Bank* who updates the *Biller's* account.

2. Data Flow

As shown in *Figure 22 - A Simplified ESP System Data Flow* on page 4, the *ESP System* passes *Statement* data in the other direction, in three distinct streams. The first two streams consists exclusively of character data; the other stream contains both character data and binary data associated with graphics (e.g., logos) and other multimedia features (e.g., sounds and movie clips).

The first stream of character data, consists of *Statement Content Records*, are sent in batches of sets, where each set represents one *Customer Statement* for one billing cycle. It is relatively small (1 to 5 KB, depending upon the *Statement*), but must be transmitted for every *Statement* processed.

The second stream of character data, consists of *Administrative Messages*, are sent between all parties in the system.

The third stream, the binary data, consists of *Statement Templates*, each representing the format and layout of a single *Statement Type*. It is relatively large (30k to 100k, depending upon the *Statement*), but is transmitted only when a change to the *Statement* format is made.

The *Statement Content Records* (SLR, SAR, and SCR in Figure 1 - e.g.: amount due, transaction details, etc.) begin at the *Statement Originator's* A/R department and are transmitted to the *Statement Service Provider's* (SSP) System. They are then passed to Visa's *Statement Originator Side ESP Workstation*, where they are processed for transfer through Visa's *ePay Switch*, and on to Visa's *ESP Statement Generation Workstation* at the CSP's site.

See *Appendix G - ESP System Data Flow Projections*.

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3. Rendering the Statement

As shown in *Figure 33 - Generating the Fully-Rendered Statement* on page 5, a set of *Statement Content Records* are combined with their *Statement Template* into *Fully Rendered Statement PDF Files*. These are then passed to the *CSP's Home Banking Software* front end for delivery to Customers either via private network or the World Wide Web.

B. Performance Objectives

Key performance objectives for the *ESP* system include the:

- Capability to produce consistent presentation-quality *Statements* completely within the control of the *Statement Originator*.
- Capability to produce *Statements* of arbitrary complexity, including variable length, multi-section *Statements* whose content and format could depend on *Customer*-specific data.
- Capability to display and print *Statements*, taking maximal advantage of available hardware, independent of platform and operating system.
- Capability to display interactive *Statements* with features, including for example, pay buttons, optional targeted marketing Generic Enclosures, World Wide Web links, the ability to transmit blank forms and receive forms data (e.g., loan applications), as well as the ability to play sound and video clips.
- Economic data transmission. This is accomplished by dividing *Statements* into durable template data and volatile content data, storing the durable data as near to the *Customer* as feasible, and thereby minimizing transmission of repetitive data through the system.

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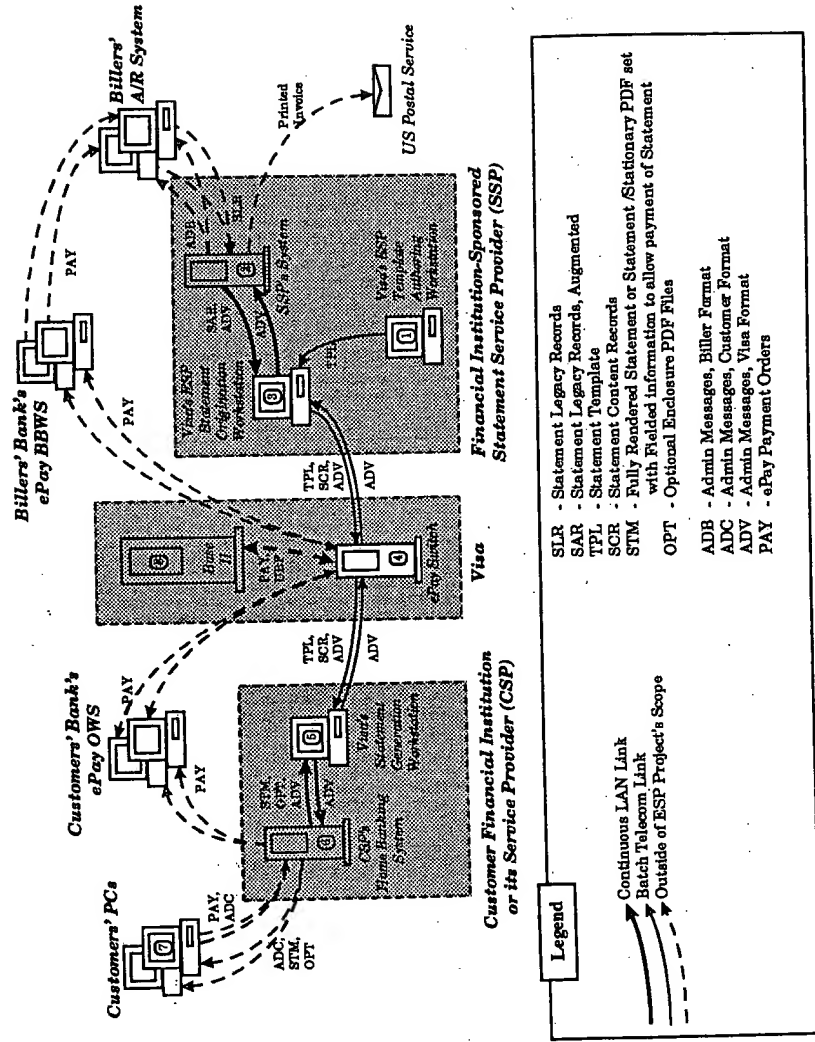


Figure 1 - Customer and Statement Originator ESP Architecture

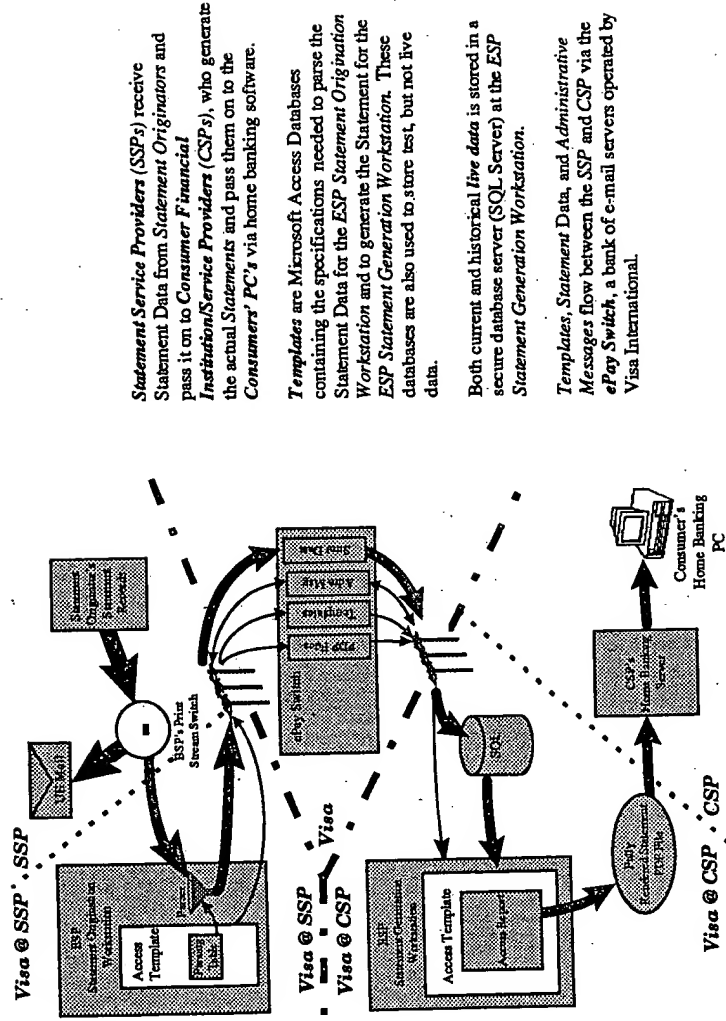


Figure 2 - A Simplified ESP System Data Flow

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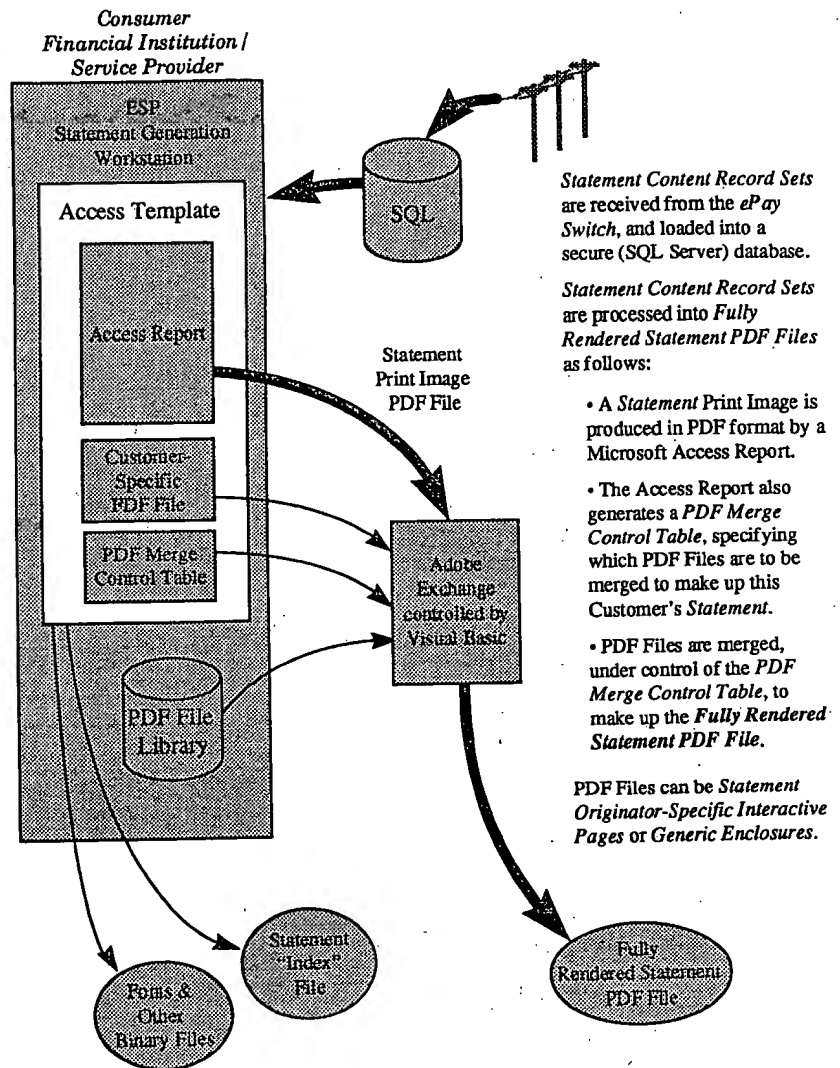


Figure 3 - Generating the Fully-Rendered Statement PDF File

C. A Glossary

1. The Players

Statement Originator	Organizations that originate statements or bills, e.g., a bank issuing statements or a local business issuing monthly bills to its customers.
Biller	A subset of <i>Statement Originators</i> , organizations that originate <i>Statements</i> that have an amount due and payable.
Biller Financial Institution	Financial institutions that serve <i>Billers</i> by receiving payments on their behalf sent through <i>Visa's ePay</i> system.
Statement Service Provider	Organizations that receive statement data from one or more <i>Statement Originators</i> and cause it to be delivered either via <i>Visa's ESP</i> system or otherwise (e.g., U.S. Mail). These may be financial institutions or other institutions, including <i>Statement Originators</i> , sponsored by financial institutions.
SSP	A <i>Statement Service Provider</i> .
Visa International	The world's largest processor of credit card transactions. Visa develops, maintains and promotes the <i>Visa ESP Service</i> . This includes the ESP System, operating rules, standards, and related pricing.
Customer Financial Institution/Service Provider	An organization that receives statement data from multiple <i>Statement Originators</i> via <i>Visa's ESP System</i> or otherwise and delivers these statements to <i>Customers</i> electronically.
CSP	A <i>Customer Financial Institution/Service Provider</i> .
Originating Banks	Financial institutions that hold the accounts <i>Customers</i> use to pay <i>Statements</i> . May or may not be a <i>CSP</i> .
Customer	<i>Statement</i> recipients. Examples of <i>Customers</i> include individuals like you and me, as well as businesses. Identified by one or more unique combinations of <i>UBF Biller ID</i> and <i>CBAN</i> .

UBF Biller ID	A unique Visa-assigned number identifying the <i>Statement Originator</i> . 12 digits
SSP Biller ID	How the <i>SSP</i> knows the <i>Statement Originator</i> .
SSP ID	A unique Visa-assigned number identifying the <i>SSP</i> . "B" & 5 digits.
CSP ID	A unique Visa-assigned number identifying the <i>CSP</i> . "C" & 5 digits.
CBAN	<i>Customer Biller Account Number</i> . How the <i>Statement Originator</i> knows the <i>Customer</i> .
CSP Account Number	How the <i>CSP</i> knows the <i>Customer</i> . Not required.

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2. The Statement

Statement	<p>A collection of <i>Documents</i> from a single <i>Statement Originator</i>, addressed to a single <i>Customer</i>, for a single <i>Statement Cycle Date</i>. Traditionally mailed in a single envelope.</p> <p>May or may not include an Amount Due.</p> <p>In an electronic statement, one document is mandatory, consisting of both <i>Customer-Specific</i> and <i>Static Documents</i>. Other documents are optional and made available at the <i>Customer's</i> request. At most, one optional document is <i>Customer-Specific</i>; the others are <i>Static</i>.</p>
Document	A portion of a <i>Statement</i> which may be <i>Static</i> , <i>Data-Bound-Fixed-Length</i> or <i>Data-Bound-Variable-Length</i> . An entire <i>Document</i> may be included or not included for a given <i>Statement</i> . Each <i>Document</i> usually consists of one or more pages.
Static Document	A document whose contents is the same for all <i>Customers</i> receiving a given <i>Statement</i> during a given <i>Statement Cycle Date</i> .
Customer-Specific Document	A document whose content is different for each <i>Customer</i> receiving a given <i>Statement</i> during a given <i>Statement Cycle Date</i> .
Generic Enclosures	A <i>Static Document</i> - one that is the same for ALL copies of the <i>Statement</i> , regardless of the <i>Customer's</i> data. Traditionally included within a <i>Statement's</i> envelope. Represented as a PDF file.
Interactive Page	<p>Adobe Acrobat Forms Objects in a PDF file which can be added to a <i>Statement PDF</i> file during creation of the <i>Fully Rendered Statement PDF File</i>.</p> <p>For an example, see Figure 44 - A Mock-Up of a <i>Statement</i> on page 11.</p>
Mandatory Customer-Specific Pages	The main <i>Customer-Specific Document</i> , included on all <i>Statements</i> . E.g.: a bill summary.
Mandatory Generic Enclosure	A <i>Generic Enclosure</i> included on all <i>Statements</i> . E.g.: regulatory notices.
Optional Customer-Specific Pages	A <i>Customer-Specific Document</i> which may be requested by the <i>Customer</i> via the <i>Interactive Page</i> . E.g.: bill details.
Optional Generic Enclosure	One of possibly several <i>Generic Enclosures</i> which may be requested by the <i>Customer</i> via the <i>Interactive Page</i> . E.g.: promotions.
Fully Rendered Statement PDF File	A <i>Statement</i> ready for viewing by the <i>Customer</i> , in a single Adobe PDF (P ortable D ocument F ormat) File.
Optional Customer-Specific PDF File	A PDF File containing <i>Optional Customer-Specific Pages</i> . At most, one per <i>Statement</i> .
Optional Generic PDF File	A PDF File containing <i>Optional Generic Enclosures</i> . There may be several of these for one <i>Statement</i> .

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Mini Statement	A summary of a <i>Statement</i> , typically based on <i>Statement Descriptor</i> data, and typically used for displaying a <i>Statement</i> on a non-conforming device (e.g.: a touch-tone telephone, as opposed to a PC or Macintosh).
Statement Cycle Date	A <i>Statement</i> reflects business done during a given time period, often one month.
Statement Descriptor	<p>A fixed set of data fields, common to ALL <i>Statements</i>.</p> <p>The data necessary for the <i>CSP</i> to generate a <i>Mini Statement</i> for the <i>Customer</i> and to allow the <i>Customer</i> to pay the <i>Statement</i> through the <i>ePay</i> system. This includes all necessary control and routing data.</p> <p>It is in the form of an ASCII comma-delimited record, and includes the filename of the associated <i>Fully Rendered Statement PDF File</i>.</p> <p>This data is defined on page 42 and depends upon <i>Statement Type</i>.</p>
Statement Types	Currently, three distinct <i>Statement Types</i> have been defined: <i>Invoices</i> , <i>Account Summaries</i> , and <i>Advisory Messages</i>
Invoices	The defining characteristic of an <i>Invoice</i> is that it can (but need not) contain a demand to be paid a specified amount by a specified date.
Account Summaries	The defining characteristic of an <i>Account Summary</i> is that it reports a summary of activity pertaining to a financial account, and does not contain an explicit demand for payment.
Advisory Messages	An advisory message is essentially a free text message delivered electronically.

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Statement Template	A Microsoft Access *.MDB file containing the resources necessary to generate a <i>Statement</i> from a <i>Statement Content Record Set</i> . Contains <i>Statement Stationary</i> and, optionally, other binary resources. Relatively large.
Statement Template Number	A unique Visa-assigned number identifying the <i>Statement Template</i> . "T" & 7 digits. E.g.: T0040456
Statement Template Version Number	A Visa-assigned number identifying a version of the <i>Statement Template</i> . 4 digits. E.g.: 1056
Statement Template ID	<i>Statement Template Number</i> + "v" + <i>Statement Template Version Number</i> . E.g.: T0040456v1056
Template Resource	Every resource file used by a <i>Template</i> . Font files, PDF files, graphics, etc.
Template Resource ID	<i>Statement Template Number</i> + "-" + <i>Statement Enclosure Number</i> . Assigned sequentially by Visa. E.g.: T0040456_0031
Statement Stationary	The stable portion of a <i>Statement</i> , in a format analogous to printed stationary. Relatively large.
Statement Content Transparency	The volatile portion of a <i>Statement</i> in PDF format. Relatively small.
Retention Period	The period of time that <i>Statement Content Data</i> is kept at the <i>ESP Statement Generation Workstation</i> . Typically 6 months.
Statement Generation	Creation of one or more <i>Statement PDF file(s)</i> from a <i>Statement Content Record Set</i> .
Statement Rendering	Processing of one or more <i>Statement PDF files</i> and, optionally, <i>Statement FDF files</i> for display.
Standard Statement Rendering Tool (SSRT)	Software designed to generate and display a <i>Statement</i> . See <i>The Standard Statement Rendering Tool</i> on page 49.

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3. The Data

SAR Stream	<i>Statement Legacy Records, Augmented - "Print Stream"</i> Statement records sent from the <i>Statement Originator</i> to the <i>SSP</i> , for <i>Customers</i> who have requested <i>ESP</i> delivery of this <i>Statement</i> , with data added by the <i>SSP</i> to assist with <i>ESP</i> processing.
SAR Record	A single record from the <i>SAR Stream</i> .
SAR Statement Record Set	The <i>SAR Stream</i> records pertaining to a single <i>Statement</i> .
SAR Document Record Set	The <i>SAR Stream</i> records making a single <i>Document</i> .
SAR Stream Type	These records come in a wide variety of formats: <i>Fixed-Length</i> , <i>Delimited</i> , and <i>Print Stream</i> records are three of the formats found in use today. <i>SAR</i> data may also be stored by the <i>SSP</i> in an <i>SQL</i> database.
Statement Content Data	Parsed and fielded <i>SAR</i> data used to generate a <i>Statement</i> .
Statement Content Record Set	<i>Statement Content Data</i> for a single <i>Statement</i> . May be in comma-delimited <i>ASCII</i> format for transmission, or in a <i>Statement Content Table Set</i> .
Statement Content Table Set	A set of <i>SQL</i> tables stored in an <i>ODBC</i> -compliant database at the <i>CSP</i> . Contains <i>Statement Content Data</i> for: <ul style="list-style-type: none"> • one <i>Statement Template</i> • many <i>Customers</i> • many <i>Statement Periods</i> (data prior to the <i>Retention Period</i> is purged))
Transmission Number (Xmn #)	This sequential number is assigned to each e-mail transmission. It is unique within each transmitter. When concatenated behind the transmitter's identification ("ePaySw", <i>SSP ID</i> , or <i>CSP ID</i>), it forms a system-wide unique identifier. e.g.: "ePaySw.342045", "B12345.23432"
Hash Total	A value calculated from a pre-defined set of data within an e-mail message, <i>ASCII</i> file, <i>SQL</i> table, or other data collection. This value is typically used to detect changes to the data.

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A. The Statement

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1. A Sample Statement

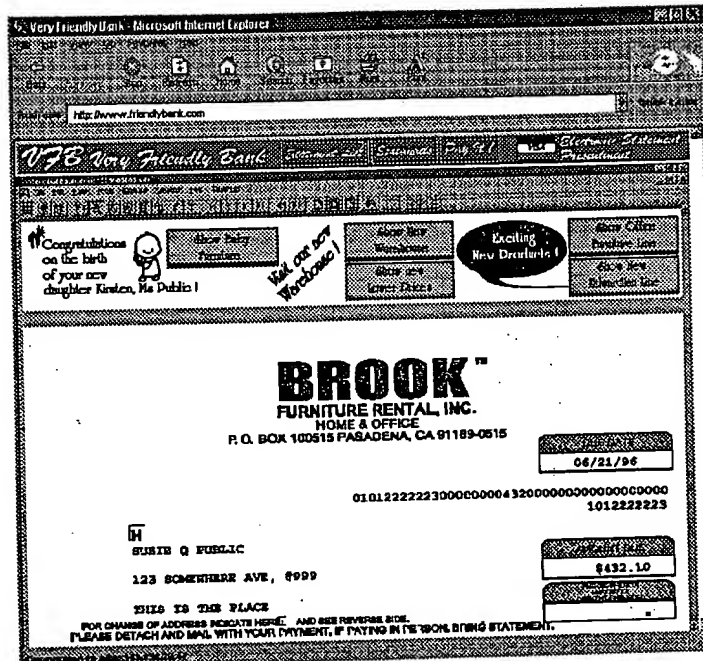


Figure 4 - A Mock-Up of a Statement

In Figure 44 - A Mock-Up of a Statement on page 11, the CSP is "Very Friendly Bank" and the SSP is "Brook Furniture Rentals".

Please note that this is a conceptual mock up only.
The final item may differ significantly from this figure.

In this example:

- The GSP uses white *Brushstroke Font* on a dark background,
- The Statement Originator uses *UniCORN Font* on a gray background.

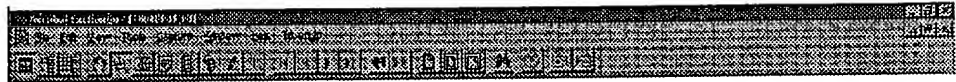
The PDF File consists of three parts: the CSP's Home Banking Software, the Interactive Page, and the Statement.

a. CSP's Home Banking Software



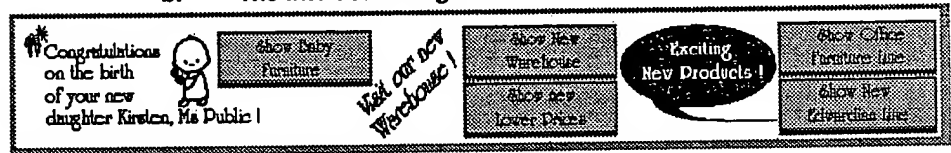
In our example, the Home Banking Software is web-based on a private *Intranet* (you can see Microsoft's Internet Explorer in the background). The CSP-supplied "Pay It" button is, in this case, an HTML button.

Many Home Banking Software systems are based on proprietary software that normally run without connection to the CSP's system. It dials up the CSP only when the Customer requests uploads or downloads of data. We refer to this type of system as "proprietary, off-line".



Either type of system can use Adobe's Reader software to display the *Fully Rendered Statement PDF Files* generated by the ESP System. (Note that Figure 4 uses Adobe Exchange - in production, Reader will be used instead).

b. The Interactive Page



This consists of an Adobe PDF Form that has 6 Objects: the "New Warehouse", "Lower Rates", "Office Furniture", and "Edwardian" buttons, which are "generic" - common to all *Customer's Statements*; a non-interactive graphical area showing the "Kirsten" message, and the "Baby Furniture" button.

The "Kirsten" message and "Baby Furniture" buttons are generated specifically for Ms Public's *Statement* by the Access Report, and are added to the form via an Adobe FDF file.

i. The Buttons

Each of the Adobe buttons can have one of a pre-defined set of actions. At this time, the following actions are defined:

- Download *Optional Enclosure x*
- Download *Optional Customer-Specific Pages*

During generation of the *Customer's Statement*, the Template generates the FDF File which defines, among other things, the actual actions taken when each of the buttons are pressed.

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For example, pressing a "Show Optional Enclosure 4" button on a web-based system may cause a web link to a CSP-specific URL, while pressing the same button on a proprietary off-line system may cause execution of a program which places an order for "Optional Enclosure 4" on the download queue for the next connection to the CSP.

The exact definition of these actions have yet to be determined.

c. The Statement

A Statement consists of four parts: *Statement Descriptor*, *Fully Rendered Statement PDF File*, *Optional Customer-Specific Pages*, and *Optional Generic Enclosures*.

i. The Statement Descriptor

This ASCII text contains all data necessary to pay the *Statement* and to display it on *Non-Conforming Devices*.

See page 42 for a definition of the *Statement Descriptor*.

ii. The Fully Rendered Statement PDF File

The *Interactive Page*, *Mandatory Customer-Specific Pages* & *Mandatory Generic Enclosures* are all included in the *Fully Rendered Statement PDF File*.

The *Mandatory Customer-Specific Pages* are generated by the Access Report within the *Statement Template* for each Customer's *Statement*.

The *Interactive Page* and the *Mandatory Generic Enclosures* are separate PDF Files.

These and, optionally, a *Customer-Specific FDF File*, are merged with the *Mandatory Customer-Specific PDF File* to make the *Fully Rendered Statement PDF File*.

iii. Optional Customer-Specific Pages

A second, *Optional Customer-Specific PDF File*, is generated, at the discretion of the *Statement Originator*, by a second Access Report within the *Statement Template*.

iv. Optional Generic Enclosures

Any number of *Optional Generic Enclosures* can be defined for a *Statement*. These are in the form of PDF files, which are downloaded at the *Customer's* request.

2. Performance Considerations

By keeping the *Mandatory Customer-Specific Pages* and *Mandatory Generic Enclosures* as small as possible, and by placing as much detail as possible into the *Optional Customer-Specific Pages*, the *Statement Originator* can

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greatly decrease the time it takes the *Customer* to see and pay their *Statement*.

Statistics on downloads of *Optional Customer-Specific Pages* and *Optional Generic Enclosures* will be kept and made available to the *Statement Originator*.

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B. TPL - The Statement Template

A *Statement Template* is a Microsoft Access v7.0 Database (an MDB file). Associated binary resources are stored within the MDB file. This file can be compressed by PKZip for efficient transmission and storage at the *ePay Switch*.

In addition, *Static Documents (Mandatory and Optional Enclosures)* are passed as Adobe PDF Files, which are transported and catalogued separately.

The power of Access Reports places few limits on the printed scope of the *Statements* that a *Statement Originator* can define. Non-print objects, such as sounds, video, web links, etc., are included as binary objects within a PDF file..

See Figure 55 - *The Statement Template* on page 16 for a definition of a *Statement Template*.

1. Statement Template ID

A *Statement Template* is identified by a *Statement Template Number*, "T" + a Visa assigned 7 digit number (e.g.: T0000001), and a *Template Version Number*, a Visa assigned 4 digit number (e.g.: 1033). Together, separated by a "v", they form a *Statement Template ID*, (e.g.: T0000001v1033).

Statement Templates are referenced by the *Template Data*

Template Index Table (see page 41).

2. Template Resource ID

Every resource file used by a *Template* is assigned a *Template Resource ID*.

Statement Template Number + "_" + *Template Resource Number*. Assigned sequentially. E.g.: T0040456_0031.

Template Resources are independent of *Template Version Number*. That is, any version of the Template can reference any *Template Resource*.

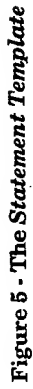
Examples of *Template Resources*: T0040456_0031.wav (sound file), T0040456_0032.pdf (PDF File), T0040456_0033.fon (font file), etc.

3. The Standard Template

A *Standard Template* (*.mdb file) will be delivered as part of each *ESP Template Generation Workstation* to assist in generation of *Templates*. This *Template* will have a simple *Statement Content Table Definition* describing the fields defined in the *Statement Index File* (see page 42), and will produce a one-page *Mini Statement*.

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For example, a *Statement* may contain 10 *Documents* in the form of Access SubReports. Each *Statement* may consist of the first 2 *Documents*, either the third or the fourth, and one, two, or three of the remaining, depending upon the value of data on the *Statement* or in the *Consumer Profile Table*.



This is any binary resources needed for generation of the *Statement*. It may include the *Statement Stationary* (analogous to printed stationary), bitmapped graphics, and fonts files.

Sounds, animation, video, WWW links, enclosure PDF files, etc. can be included in PDF files.

Current research reports good success using Corel's CorelDRAW files (*.cdr) instead of bitmaps. These vector-based files are MUCH smaller than bitmaps (ratio of 20:1 have been observed), and can be generated using Microsoft Access' CorelDRAW import facility. Similar results are expected for Micrografx Designer® files. For a complete list of acceptable Stationary types, see the Access documentation on the *Report Object's Picture Property*.

Property:

Note that this is a built-in Access facility which allows greater flexibility to the *Template* designer. It does not use OLE and therefore does not require extra software at the *ESP Statement Generation Workstation*.

If an OLE link to a favorite desktop program (such as Microsoft Excel for charting) is requested by a significant portion of *SSPs*, that software could become a part of the *Statement Generation Workstation*. Note, however, that for this to work, *Statement Generation Workstation* at ALL CPS sites will have to install this software.



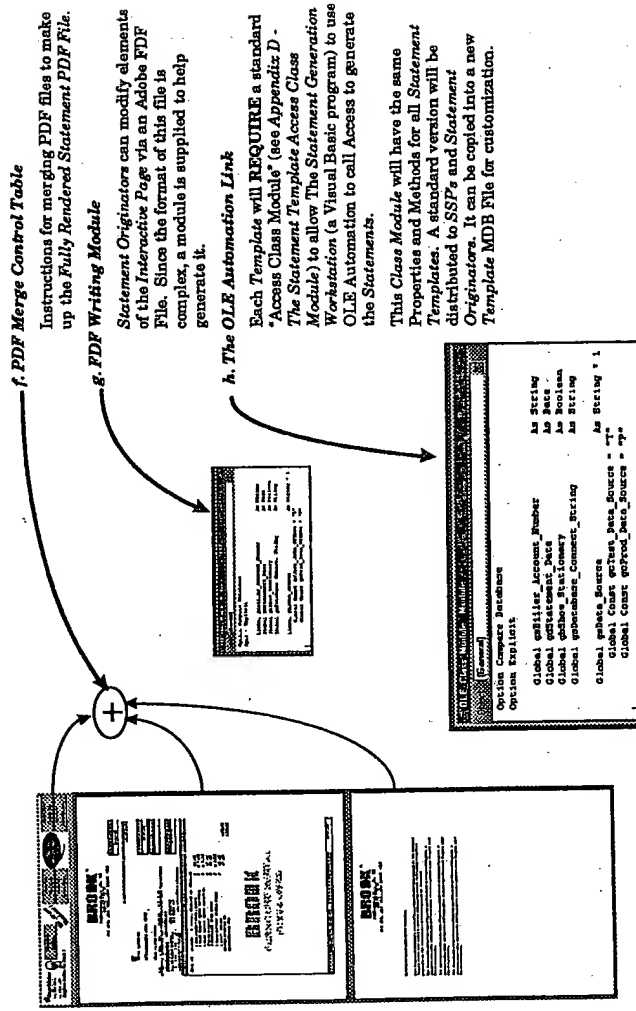


Figure 5 - The Statement Template (continued)

4. Incremental *Template* Updating

Statement Originators are expected to make some change to their *Templates* with each billing cycle (e.g., monthly). Since each *Template* is an integral *.mdb file, typically ranging between 0.5 and 1.5 mB in size, a full update of these *Templates* across the system would be prohibitively costly, particularly when the full update must be broadcast to tens of *CSPs*.

Hence, one requirement for ESP design is that *Template* updating be efficient in terms of data communication. That is, we want to ensure that only changed data is transported with each update, and that unchanged data is not transported unnecessarily. A second requirement is that pre-pilot coding effort be minimized to reduce schedule risk.

For commercial scale operations, the update procedure will be as follows:

- The initial version of a *Template* (e.g., T1234567v0000) will contain all necessary elements within one *.mdb file.
- Any changes whatsoever to this *Template* will cause the *ePay Switch* to issue a new version number (e.g., T1234567v0001).
- Changes will be passed as *.mdb files also; however, only those elements in the *Template* that have been changed will need to be included. Since these *.mdb files will contain only changes to code modules, they can be compressed to very small size.
- These changes might include new resources (PDF files, fonts, etc.), new report definitions, or new code modules.
- The update .mdb file will be designated appropriately (e.g. U1234567v0001).

A general procedure will be written to combine the existing full version with the new update to produce a new full version (T1234567v0001). This general procedure will be made available to the *ESP Template Authoring Workstation* so that the merger process can be verified by the *Statement Originator*. The procedure will also exist at the *ePay Switch* and at the *ESP Statement Generation Workstation*.

a. How it Works

When the *ePay Switch* receives an update *Template*, it first attempts to merge the update with the existing full *Template* and validate the result. If this is successful, then the *ePay Switch* saves both the new full *Template* and the update as two distinct .mdb files, and sends an Ack response to the *ESP Statement Origination Workstation*. If this is unsuccessful, then the *ePay Switch* sends a Nak response to the update request.

Statement Content Records passing through the *Statement Origination Workstation* are stamped with the version number of the *Template* processing it. When *Statement* data with the new *Template* version is received at an *ESP Statement Generation Workstation*, a new *Template* must be pulled from the *ePay Switch*.

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If the *Statement Generation Workstation* has the *most recent* prior *Template* stored locally (e.g.: T7654321v0056, when it needs T7654321v0057), it can request just the update .mdb file. Otherwise, it must request the full .mdb file. Two different ADV messages are provided to indicate the nature of the request.

b. **For the ESP Pilot**

Notwithstanding the preceding, this incremental *Template* updating capability may be stubbed out for pilot to minimize schedule risk and since data flows will be low.

That is, *Statement Generation Workstations* will ALWAYS request full updates, and the *ePay Switch* will respond to BOTH update and full requests with full *Templates*.

That way, as Pilot systems are converted to production capability, no errors will occur.

C. **ESP System's Data Transmissions**

The *ESP System* moves *Statement Content Records* and *Admin Messages* from the *ESP Statement Origination Workstation* to the *ePay Switch* and from the *ePay Switch* to the *ESP Statement Generation Workstation*.

It also moves *Admin Messages* in the other direction. This traffic is in one of three forms: *Statement Content Records*, *Simple Admin Messages*, and *Complex Admin Messages*.

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The following examples show Microsoft's Exchange Client, a user interface to Exchange. ESP will do much the same things, but under program control.

1. Statement Content Records

Statement Content Records travel in Sets. A *Statement Content Record Set* is all of the records needed to generate a single *Statement*. Several of these *Sets* (up to some specified limit, say 5,000 - depending upon e-mail efficiency) are transmitted to a single *CSP* at once.

See *The ESP Statement Origination Workstation* on page 53 for a complete description of *Statement Content Record* transmission.

Note: this e-mail example contains two enclosures: ASCII Files T1234567v1006.txt & T1234567v1006_Items.txt.

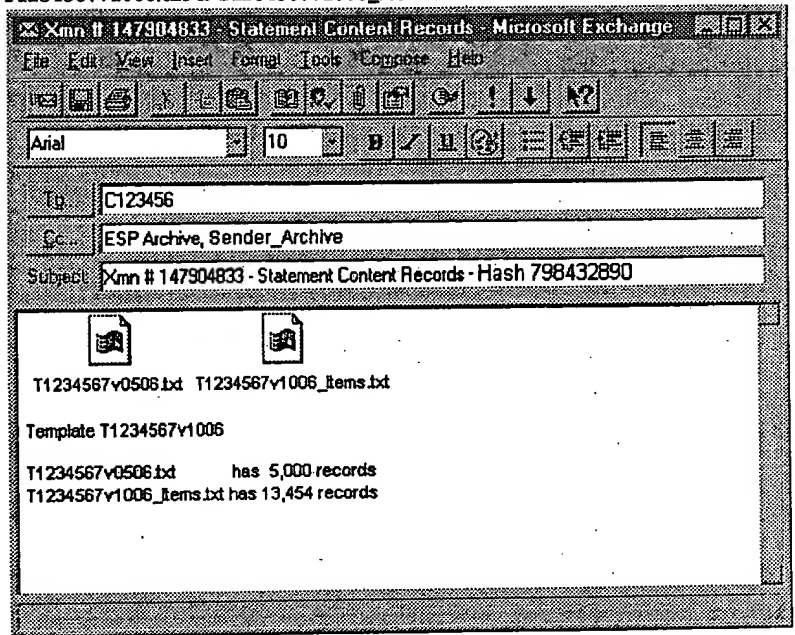


Figure 6 - A *Statement Content Record* E-Mail

2. Simple Administrative Messages

These e-mail messages are generated one line at a time - each line is one message.

They are transmitted when they reach some limit of records, when an urgent event occurs, or when a *Request End-of-Day Shutdown Admin Message* is received.

Note the "Type" column. "SCR" is "*Statement Content Records*", "Tix" is "*Transmission Index*", and "ADV" is "*Administrative Messages, Visa Format*". Other possibilities include "TAK" - "*Transmission*".

Acknowledgment", and all of the simple of the ADV's defined in the UBF - Universal Biller File on page 28. It is not necessary that this column be restricted to 3 characters.

To	Xnn #	Date & Time	Type	Hash	Recrd	Encl	Bytes
C01234323	147904833	1998-07-06 14:33	SCR	798432980	100	2	1667
ESP Archive	147904834	1998-07-06 14:33	TIx	393930954	100	0	0
C00234123	147904835	1998-07-06 14:34	ADV	003240243	100	0	0
C00987132	147904836	1998-07-06 14:34	SCR	793128328	100	2	1851
ESP Archive	147904837	1998-07-06 14:34	TIx	828131932	100	0	0

Figure 7 - Simple Administrative Messages E-Mail

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3. Complex Administrative Messages

These E-Mails are one message each. Their data can be ASCII text, as in the figure below, or binary enclosures, such as *Statement Templates* or *Template Resource Files*.

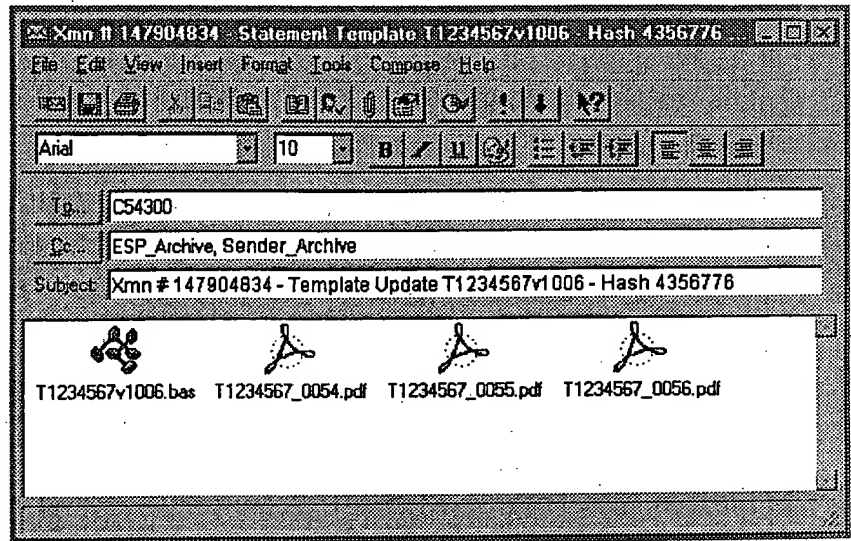


Figure 8 - Complex Administrative Message E-Mail

4. Properties of All Electronic Mail Transmissions

As can be seen in the previous examples, all transmissions have the following properties: main destination ("To"), copy destination ("CC"), *Transmission Number* (Xmn #), Title, and Hash Total.

a. Main Destination ("To")

For *Statement Content Records*, this will be the *Customer's CSP ID*. For *Admin Messages (ADV)*, this will be a *CSP ID*, a *SSP ID*, *ESP Transmission Control*, *ESP Archive*, or *ESP Template Control*.

b. Copy Destination ("CC")

For *Statement Content Records*, this will be *ESP Archive*.

c. Transmission Number (Xmn #)

This is a sequential number unique within each transmitter. Concatenated behind the transmitter's identification ("ePaySw", *SSP ID*, or *CSP ID*), this forms a system-wide unique identifier.

If forms the first part of the message's Subject line.

E.g.: "Xmn # 147904834 - Template Update - Hash 32178992"

d. Title

What this transmission contains.

It forms the second part of the Subject line.

E.g.: "Xmn # 147904834 - **Template Update** - Hash 32178992"

e. Hash Total

Each type of message will have a rule for generating a hash total. For *Statement Content Record* transmissions, it will be the addition of the ASCII values of one or more of the *Statement Index* fields (see page 42).

It forms the third part of the Subject line.

E.g.: "Xmn # 147904834 - **Template Update** - Hash 32178992"

5. Duplicate File Control

The following section applies to all parts of the *ESP System* sending e-mail messages.

To ensure that e-mail messages are not sent more than once by mistake, the *Transmission Log* (see page 46) is kept. This is a record of each transmission and its hash total.

Before a message is queued for sending, its hash total is compared to all of those on the table. If a match is found, the message is sent to a suspense mailbox and an operator message is generated.

To be transmitted, the message must be manually requeued by the operator.

6. ESP Transmission Control

The following section applies to all parts of the *ESP System* sending e-mail messages.

ALL e-mail messages sent MUST be accompanied by a *Transmission Sent to ePay Switch* ADV sent to the *ESP Transmission Control* mailbox. This ADV includes a hash total calculated from pre-determined values within the message.

In addition, ALL e-mail messages received MUST be accompanied by a *Transmission Received from ePay Switch* ADV to the *ESP Transmission Control* mailbox. This ADV also includes a hash total calculated from the same pre-determined values within the message.

During normal operation, when an e-mail message is generated, it is copied into the generation workstation's "Sender Archive" mailbox.

When the *ESP Transmission Control* mailbox receives a *Transmission Received* ADV corresponding to a valid *Transmission Sent* ADV, with the same hash totals, it forwards the ADV to the workstation that originally generated the message. Upon receipt of the *Transmission Received* ADV, the workstation deletes the original message from its "Sender Archive" mailbox.

If delivery of the message fails for some reason, a "Message Not Delivered" message is sent to the workstation. Receipt of this message results in

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notification of the operator and automatic re-transmission (up to a pre-determined number of times).

In this way, delivery is assured.

7. **ESP Archive**

A requirement of Visa switching systems is that all traffic through them must be available for auditing purposes for some pre-defined period of time. This is accomplished at the *ePay Switch* via the *ESP Archive* mailbox.

Rather than slowing down processing of message traffic with mail robots (Visual Basic programs manipulating e-mail messages via MAPI - Messaging Application Programming Interface) reading every message, significant messages are forwarded to the *ESP Archive* mailbox, where they are stored for later research.

All *Statement Content Record Messages* are stored in their entirety. For each such message, a separate *Transmission Index Message* is also sent to the *ESP Archive* mailbox. This message is an index showing the *CBANs* represented within each *Statement Content Record Message*.

The *Standard Statement Rendering Tool* (see page 49) can then be used to recreate ANY *Statement* that passes through the *ESP System*.

8. **End-of-Day Processing**

To ensure that all e-mail transmissions are accounted for, the entire *ESP System* will be closed for a period each day, during which traffic reporting will be performed.

a. **The *ePay Switch* Initiates End-of-Day Processing**

The *ePay Switch* initiates *End-of-Day Processing* by sending a *Request End-of-Day Shutdown ADV* to each *ESP Statement Origination Workstation* and to each *ESP Statement Generation Workstation* in the system which has not already sent in an *End-of-Day Shutdown ADV*.

b. **The Workstations Respond**

The Workstations can perform *End-of-Day Processing* in one of two ways:

- by waiting for the *Request End-of-Day Shutdown ADV* from the *ePay Switch* before stopping processing and sending their *End-of-Day Shutdown ADV*, or
- by sending an *End-of-Day Shutdown ADV* when they have finished their day's processing, and then shutting down.

c. **The *ePay Switch* Reports**

Once *End-of-Day Shutdown ADVs* have been received from all workstations, the *ePay Switch* will stop processing newly received messages and will generate its *End-of-Day Reports*. These reports

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will include a traffic analysis for each workstation (messages received + messages stored = messages sent + messages on hand) and other reports.

Each workstation will then be sent its *End-of-Day Report*.

d. The ESP System Restarts

Those workstations left running will sign on to the *ePay Switch* and look for their *End-of-Day Report* messages. If they do not find it, they will try again later.

Workstations which sent their *End-of-Day Shutdown ADV's* before receiving the *ePay Switch's Request End-of-Day Shutdown ADV*, and which were shut down, will look for their *End-of-Day Report* message upon starting up.

Once the *End-of-Day Report* message is received, operations will proceed.

Comparison of the *End-of-Day Report* from the *ePay Switch* and the workstation's own *End-of-Day Report* is a manual operation performed by the workstation's operators. Any discrepancies must be dealt with manually.

e. Potential Problems and Their Effects

The ESP System has three kinds of data transmissions: Administrative Messages (ADV), Templates, and Statement Content Records.

The following potential problems have been identified: transmission not received, transmission received more than once, transmission garbled.

Each of these errors are detected and corrected by Microsoft Exchange. In addition, the ESP System will check itself, as follows:

All transmissions are copied to a local holding area AND they and their hash totals are recorded at the *Transmission Control* mailbox at the *ePay Switch*.

Upon receipt, the hash totals are checked and the *Transmission Control* mailbox is notified. It, in turn, notifies the sending workstation, which deletes its copy of the message from its local holding area.

1. Transmission Not Received

(a) Detection

During *End-of-Day Processing*, transmissions are left in the local holding area OR the *Transmission Control* mailbox is out of balance.

(b) Correction

Locate the lost message. Re-transmit if necessary.

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II. Transmission Sent More Than Once

(a) Detection

Each transmitting workstation keeps a *Transmission Log* (see page 46), recording each transmission made with its hash totals. Detection of a duplicate hash total will cause the transmission to go to a suspense mailbox where the workstation operator will have to manually release it.

(b) Correction

(i) *Administrative Messages (ADV)*

Each *ADV* message will have to be examined and a strategy developed to handle duplicates.

(ii) *Templates*

Duplicating a Template transmission will have no effect.

(iii) *Statement Content Records (SCR)*

Duplicate *SCR* transmissions will be rejected by the *ESP Statement Generation Workstation* via referential integrity errors.

III. Transmission Garbled

(a) Detection

A pre-defined hash total is calculated for each message before it is transmitted, and it is appended to the message's *Subject* line.

Upon receipt, the same hash total is re-calculated. If the two totals do not match, an error has been detected.

(b) Correction

- i. Notify the workstation operator.
- ii. Request a re-transmission.

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D. ESP's Data

1. Statement Originator Data

a. UBF - Universal Biller File

This is the definitive list of *Statement Originators* and *Statement Originator* relationships. It is extracted by the *ePay Switch* which uses it to generate the *ESP Template/Originator Table* for the *ESP Statement Generation Workstation* and the *ESP Statement Origination Workstation*, and the *Statement Originator Xref Table* for its own use.

	Field	Type	Comments
Key	UBF Biller ID	Text 12	Unique Visa-assigned number
	Expiration Date	Date	
	Effective Date	Date	
	SSP ID	Text 16	"B" & Unique Visa-assigned number
	Statement Originator Name	Text	
	Statement Delivery Notification Flag	Yes/No	Does <i>Statement Originator</i> want to know when Customer downloads <i>Statement</i> ? See ADV #8-8d
	Paper Statement Option	Text 1	"1": Always Mailed "2": Never Mailed "3": Mailed at <i>Customer</i> request only "4": Not Mailed at <i>Customer</i> request only
	Who Authorizes Customers ? (Statement Originator Capabilities Parameter: byte 1 of 24)	Text 1	"A": All <i>Customers</i> can sign up "B": SSP will confirm <i>Customer</i> sign up "E": ESP will confirm <i>Customer</i> sign up See ADV #1
	Full Statement Device Option	Text 2	"CD": Conforming Devices only "ND": Non-Conforming Devices only "CN": Both Conforming & Non-C devices

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b. **SSP Template/Originator Table**

Generated by the *ePay Switch* from the *UBF* and the *Template Index File* for the *ESP Statement Origination Workstation*, this table contains *Statement Originators* who are *ESP Active*.

The *Template OK* field must be "Yes" and the *UBF Expiration Date* must not be passed before *Customers* can request *ESP* delivery of a *Statement* or *Statement Content Record Sets* for this *Statement Originator* can be passed from the *ESP Statement Origination Workstation* to the *ESP* system.

The *Template OK* field is set when the *Statement Originator* successfully registers a *Template* with the *ePay Switch*. It is cleared if the last valid *Template* expires.

Since *Statement Content Record Sets* can only be held for a short period of time at the *ESP Statement Origination Workstation*, registering an up-to-date *Template* as soon as possible is imperative.

Key	Field	Type	Comments
	Template ID	Text 8	A Unique Visa-assigned number identifying a Statement Template. "T" & 7 digits. E.g.: T1234567.
Alt Key	UBF Biller ID	Text 12	Unique Visa-assigned number
Alt Key	SSP Biller ID	Text 16	Number that the SSP knows the Statement Originator by
	SSP ID	Text 12	
	UBF Expiration Date	Date	
	UBF Effective Date	Date	
	Template Name	Text	
	Statement Originator Name	Text	
	Statement Delivery Notification Flag	Yes/No	Does Statement Originator want to know when Customer downloads Statement ? See ADV #8-8d
	Paper Statement Option	Text 1	"1": Always Mailed, "2": Never Mailed, "3": Mailed at Customer request only "4": Not Mailed at Customer request only
	Customer Sign Up - Statement Originator Capabilities Parameter: byte 1 of 24	Text 1	"A": All Customers can sign up "B": SSP will confirm Customer sign up See ADV #1
	Template OK	Yes/No	Is this a valid Template ?

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c. CSP Template/Originator Table

Generated by the *ePay Switch* from the UBF and the *Template Index File* for the *ESP Statement Generation Workstation*, this table contains *Statement Originators* who are *ESP Active* and their *Templates*.

	Field	Type	Comments
Key	Template ID	Text 8	A Unique Visa-assigned number identifying a Statement Template. "T" & 7 digits. E.g.: T1234567.
Alt Key	UBF Biller ID	Text 12	Unique Visa-assigned number
	SSP ID	Text 12	
	UBF Expiration Date	Date	
	UBF Effective Date	Date	
	Template Name	Text	
	Statement Delivery Notification Flag	Yes/No	Does <i>Statement Originator</i> want to know when Customer downloads <i>Statement</i> ? See ADV #8-8d
	Full Statement Device Option	Text 2	"CD": Conforming Devices only "ND": Non-Conforming Devices only "CN": Both Conforming & Non-C devices
	Template OK	Yes/No	Is this a valid <i>Template</i> ?

2. Administrative Messages

a. ADV - Administrative Messages, Visa Format

They will be comma-delimited ASCII records in the following basic format:

Field	Comments
From	UBF Biller ID, or CSP ID
To	UBF Biller ID, or CSP ID
Create Date Time	Date & Time to nearest second
ADV Type	Which message?
ADV Data	Comma-delimited message fields, dependent upon ADV Type

Note that additional fields will be needed for response tracking.

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ADV - Administrative Messages, Visa Format

Notes: Req = Request, Ack = Acknowledgment, Nak = Negative Acknowledgment

Message	From	Generated When	To	Action
1 Customer Statement Delivery Req	CSP	Customer selects a Statement for ESP	SSP	Request Statement Originator's OK If Reject then Return Nak with error message Else If Test Account Request then Create Customer Test Profile Return Test Ack Else Create Customer Profile Return Ack
1a Customer Statement Delivery Ack	SSP	Statement Originator accepts Customer Statement Delivery Req	SO Wstn	Updates BS Customer Profile Passes on to SG Wstn
	SO Wstn		SG Wstn	Updates CS Customer Profile Passes on to CSP
	SG Wstn		CSP	Pass on to Customer
1b Customer Statement Test Delivery Ack	SSP	Statement Originator accepts Delivery Req in test mode	SO Wstn	Updates BS Cust Profile Test Mode Passes on to SG Wstn
	SO Wstn		SG Wstn	Updates CS Cust Profile Test Mode Passes on to CSP
	SG Wstn		CSP	Pass on to Customer
1n Customer Statement Delivery Nak	SSP	Statement Originator rejects Customer Statement Delivery Req	CSP	Pass on to Customer
1c Customer Ads Change Req	CSP	Customer wants change to Ads	SSP	Return Ack with new value
1d Customer Ads Change Ack	SSP		CSP	Update SSP & CSP Customer Profile Pass on to Customer

569901"569820901d57
Esp System Architecture

1e	Customer Ads Change Nak	SSP		CSP	Pass on to Customer
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ESP System Architecture

Message	From	Generated When	To	Action
2 Customer Statement Delivery Termination Req	CSP	Customer requests that a Statement be no longer selected for ESP. Termination date optional.	SSP	Request Statement Originator's OK If Reject then Return Nak with error message Else Set Termination Date in Customer Profile Return Ack End If
2a Customer Statement Delivery Termination Ack	SSP	Statement Originator accepts Customer Statement Termination Req	SO Wstn	Update Termination Date in ES Customer Profile Pass on to SG Wstn
	SO Wstn		SG Wstn	Delete CS Customer Profile Pass on to CSP
	SG Wstn		CSP	Pass on to Customer
2n Customer Statement Delivery Termination Nak	SO Wstn	Statement Originator rejects Customer Statement Termination Req	CSP	Pass on to Customer
3 Customer Statements Available Query	CSP	Customer requests Statement List.	SG Wstn	Generates List of Statements available, including prior-periods.
3a Customer Statements Available List	SG Wstn		CSP	Pass on to Customer
4 CBAN Change	SSP	Statement Originator Splits & Mergers. Includes Effective Data with Old & New UBPF Bill ID & CBANs	CSP	Needed for displaying historical (prior period) Statements. ESP ignores this message, since Statement requests come from the CSP.

ESP System Architecture

Message	From	Generated When	To	Action
---------	------	----------------	----	--------

The CSP can operate in one of two ways: by *Pulling* all *Statements* as they are generated and controlling them, or by *Pulling Statements* only as *Customers* request them. This is shown by the two blocks below:

5	Statement Download Req: Pull all	CSP	CSP requests all <i>Statement</i> currently available for download	SG Wstn	Return a <i>Statement</i> Download Pointer pointing to each available <i>Fully Rendered Statement PDF File</i> Record Pull Date
5a	Statement Download Pointer	SG Wstn		CSP	Hold <i>Statement</i> Download Pointers until <i>Customers</i> request them.
5b	Statement Download Push	CSP	<i>Customer</i> requests download of a <i>Statement</i>	SG Wstn	Record Push Date

... OR ...

5c	Statement Download Req: Pull & Push	CSP	<i>Customer</i> requests download of a <i>Statement</i> , by <i>UBF Biller</i> ID, <i>CBAN</i> and <i>Statement Cycle</i> Data.	SG Wstn	If <i>Statement</i> purged then Generate <i>Statement</i> for End If If OK then Return Pointer Record Pull & Push Dates Else Return Nak Template/ <i>Customer/Period</i> .
5a	Statement Download Pointer	SG Wstn		CSP	Download <i>Statement</i>
5n	Statement Download Nak	SG Wstn		CSP	Inform <i>Customer</i>

Message	From	Generated When	To	Action
6	Optional Details Download Req	CSP	SG Wstn	Generate Optional Details for Template, Customer, & Period If OK then Return Pointer Else Return Nak
6a	Download Pointer	SG Wstn	CSP	Download Optional Data
6n	Optional Details Download Nak	SG Wstn	CSP	Inform Customer
7	Optional Enclosure #x Download Req	CSP	SG Wstn	If Available then Return Pointer Else Return Nak
7a	Optional Enclosure Download Pointer	SG Wstn	CSP	Download Optional Enclosure #x
7n	Optional Enclosure Download Nak	SG Wstn	CSP	Inform Customer
8a	Statement Pushed (to Customer)	SG Wstn	SO Wstn	Record for SSP Query
8b	Optional Details Pushed	SG Wstn	SO Wstn	Record for SSP Query
8c	Optional Generic Enclosure #x Pushed	SG Wstn	SO Wstn	Record for SSP Query
8d	Statement not Pushed by Due Date	SG Wstn	SO Wstn	Inform SSP

Depending upon the UBF Invoice Delivery Notification Flag field (see UBF - Universal Biller File on page 28), the following Messages may be generated and transmitted (except 8d, which is ALWAYS generated and transmitted) as part of the End-of-Day processing:

95001" 5602009015"

ESP System Architecture

Message	From	Generated When	To	Action
9	New Statement Template # Req	Tmpl Wstn	SSP requests a new Statement Template Number	ePay Sw Generate new Statement Template #. If OK then Return Ack Else Return Nak
9a/9n	New Statement Template # Ack/Nak	ePay Sw	Tmpl Ws	Inform SSP
10	Statement Template in Test Service Req	Tmpl Wstn	SSP sends a new or changed Test Template	ePay Sw Check Template. If Ok Then Move Tpl To Download Test Area Return Ack Else Return Nak
10	Statement Template in Service Req	Tmpl Wstn	SSP sends a new or changed Template	ePay Sw Check Template. If Ok Then Move Template To Download Area Return Ack Else Return Nak
10a	Statement Template in Service Ack with new Template Version Number	ePay Sw	Tmpl Wstn	Inform SSP
10n	Statement Template in Service Nak with Errors found	ePay Sw	Tmpl Wstn	Inform SSP
11	Statement Template Deactivate Req	Tmpl Wstn	SSP requests deactivating Template	ePay Sw If Date in future then Set Template Expiry Date Return Ack Else Return Nak
11	Template Deactivate / Effective Date	ePay Sw	SG Wstn	Update Template Index File
11a/11n	Statement Template Deactivate Ack/Nak	ePay Sw	Tmpl Wstn	Inform SSP

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ESP "Sent" System Architecture

Message	From	Generated When	To	Action
15	Statement Template Download Request	SG Wstn	SCR's received for this Template Number and Template Version	ePay Sw Record download
15	Test Statement Template Download Request	SG Wstn	Test SCR's received for this Template Number and Template Version	ePay Sw Record Test Template Record Test download
16	Transmission sent to ePay Switch	SO Wstn SG Wstn	Transmission sent	ePay Sw Record traffic for reporting Pass on to sender
16a	Transmission received from ePay Switch	SO Wstn SG Wstn	Transmission received	ePay Sw Remove transmission from "Sent" mailbox
17	Request End-of-Day Shutdown	ePay Sw	End of day	SO Wstn SG Wstn Stop sending SCR & ADV messages Send End-of-Day Shutdown Message
17a	End-of-Day Shutdown	SO Wstn SG Wstn	Message received from ALL SSP's & CSP's	ePay Sw Generate End-of-Day Reports for ALL SSP's & CSP's, print them and send them out
17b	End-of-day Report	ePay Sw		SO Wstn SG Wstn Pass Report on to host ... Resume transmission of SCR & ADV messages

b. **ADC - Administrative Messages, Customer Format**

These are *Administrative Messages* in the format required for communication between the *CSP's Home Banking System* and the *Customer's PC*. They are neither generated nor received by *ESP* components and are outside the scope of the *ESP Project*.

3. **Customer Data**

a. **SSP Customer Profile Table**

This Table is maintained at the *ESP Statement Origination Workstation*. It is passed on to the *SSP* where it is used to extract *SAR Statement Record Sets* for *ESP* delivery from the main Print & Mail data stream.

All changes must be authorized by the *SSP* or *Statement Originator*.

Note that the *CSP Account Number*, the number that the *CSP* knows the *Customer* by, may be considered confidential by some *CSP's* (for example, it may be a bank account number). As a result, the combination *UBF Biller ID* & *CBAN* is used to uniquely identify a *Customer*.

	Field	Type	Comments
Key	<i>UBF Biller ID</i>	Text 12	Unique Visa-assigned number
Key	<i>CBAN</i>	Text 12	How the <i>Statement Originator</i> knows the <i>Customer</i>
Key Dec	<i>Expiration Date</i>	Date	
	<i>Effective Date</i>	Date	
	<i>Template Number</i>	Text 8	Note: No <i>Template Version Number</i>
	<i>CSP ID</i>	Text 7	"C" & Unique Visa-assigned number
	<i>Test Account Flag</i>	Yes/No	Used for <i>SSP Test</i> runs
	<i>Advertisements Requested</i>	Text 5	Value assigned by <i>SSP</i> via <i>ADV</i>
	<i>Hard Copy</i>	Yes/No	
	<i>Hard Copy Until</i>	Date	

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b. **CSP Customer Profile Table**

This Table is maintained at the *ESP Statement Generation Workstation*.

All changes will be triggered by receipt of a "*Customer Statement Delivery Ack*" or "*Customer Statement Delivery Ack*" ADV at the *Workstation*.

Note that the *CSP Account Number*, the number that the *CSP* knows the *Customer* by, may be considered confidential by some *CSP's* (for example, it may be a bank account number). As a result, the combination *UBF Biller ID* & *CBAN* is used to uniquely identify a *Customer*.

	Field	Type	Comments
Key	<i>UBF Biller ID</i>	Text 12	Unique Visa-assigned number
Key	<i>CBAN</i>	Text 12	How the <i>Statement Originator</i> knows the <i>Customer</i>
Key Dec	<i>Expiration Date</i>	Date	
	<i>Template Number</i>	Text 8	Note: No <i>Template Version Number</i>
Alt Key	<i>CSP Account Number</i>	Text 20	Specified by <i>CSP</i> . Not currently used by <i>ESP</i> .
	<i>Test Account Flag</i>	Yes/No	Used for <i>SSP Test</i> runs
	<i>Advertisements Requested</i>	Text 5	Value assigned by <i>SSP</i> via ADV
	<i>Display Full Graphics</i>	Yes/No	
	<i>Summary Statements</i>	Yes/No	
	<i>Detailed Statements</i>	Yes/No	

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4. Template Data

a. Template Index Table

This table is maintained by the *ePay Switch* and downloaded to the *ESP Statement Origination Workstation* and *ESP Statement Generation Workstation (SGen)*.

	Field	Type	Comments
Key	Template Number	Text 8	A unique Visa-assigned number identifying the <i>Statement Template</i> . "T" & 7 digits. E.g.: T0040456
Key	Template Version Number	Text 4	A Visa-assigned number identifying a version of the <i>Statement Template</i> . 4 digits. E.g.: 1056
Key Dec	Effective Date	Date	Required date
	Expiration Date	Date	May be Null
	SSP ID	Text 7	"B" & Unique Visa-assigned number
	UBF Biller ID	Text 12	Unique Visa-assigned number
	Status Flag	Text 1	"A": Number Assigned but no <i>Template</i> "E": <i>Template</i> Certification Error "O": <i>Template</i> On Site (SGen only) "P": <i>Template</i> Pending Certification "R": Download Requested (SGen only) "S": <i>Template</i> in Service "T": <i>Template</i> in Test Service "X": <i>Production Error</i> !

5. Statement Data

a. SLR - Statement Legacy Records

The records sent to the *SSP* by a *Statement Originator* to generate *Statements* for a given *Statement Cycle Date*.

SLR records are split into two streams by the *SSP*; those for *Customers* whose *Statements* are to be printed, and those for *Customers* whose *Statements* are to be delivered by the *ESP Service*.

Note that for the pilot, all *Statements* delivered by the *ESP Service* will also be printed. In addition, some *Customers* may elect to have their *Statements* both printed and delivered electronically.

b. SAR - Statement Legacy Records, Augmented

To be processed by the *ESP System*, *Statement Content Records* must contain all of the data defined by the *Statement Descriptor* (see page 42).

Any of this data not supplied by the *Statement Originator* must be added by the *Statement Service Provider (SSP)*, much of it from the *Customer Data*

SSP Customer Profile Table (see page 39).

This data may include:

- *Template ID = Template Number & "v" & Template Version Number*
- *UBF Biller ID*
- *CSP ID*
- *CBAN*
- *Statement Cycle Date*
- *Late Payment Date*

SAR records will be passed to the *ESP Statement Originating Workstation* in the form of comma-separated files (CSV) for processing.

c. SCR - Statement Content Records

These are SAR records which have been re-packaged for transmission to *The ePay Switch*, according to the definitions in the *Statement Template*, into comma-delimited records for optimal transmission efficiency. They are loaded into SQL tables by the *ESP Statement Generation Workstation*.

d. Statement Descriptor

The minimum data required by the ESP System to be included with a *Statement*.

This data is used by the *CSP* to generate a *Mini Statement* for the *Customer* and to allow the *Customer* to pay the *Statement* through the *ePay* system.

Other and associated sets of *Descriptor* variables will be added in response to *Statement Originator* demand.

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Each record has the following fields (Note that since this is a comma-delimited ASCII file, text lengths are not needed):

Key	Field	Type	Comments
Key	Template ID	Text	Template Number & "v" & Template Version Number
Key	CBAN	Text	
Key Dec	Statement Date	Date	
	CSP Account Number	Text	How the CSP knows the Customer
	UBF Biller ID	Text	
	Late Payment Date	Date	
	Statement Delivery Notification Flag	Yes/No	
	Customer Name	Text	
	Customer Address 1	Text	
	Customer Address 2	Text	
	Customer City	Text	
	Customer State	Text	
	Customer Country	Text	
	Customer Postal ZIP Code	Text	
	Statement Type	Text 1	"A" => Advisory Message "I" => Invoice, "S" => Account Summary
	Message Type	Text	Advisory Message Only
	Message Text	Text	Advisory Message Only
	Sender Name	Text	Advisory Message Only
	Sender Title	Text	Advisory Message Only
	Sender Address 1	Text	Advisory Message Only
	Sender Address 2	Text	Advisory Message Only
	Sender City	Text	Advisory Message Only
	Sender State	Text	Advisory Message Only
	Sender Country	Text	Advisory Message Only
	Sender Postal Code	Text	Advisory Message Only
	Sender Telephone	Text	Advisory Message Only
	Sender Fax	Text	Advisory Message Only
	Sender E-Mail	Text	Advisory Message Only
	Total Amount Due	Currency	Invoice Only
	Minimum Amount Due	Currency	Invoice Only
	Past Due Amount	Currency	Invoice Only
	Current Charges	Currency	Invoice Only
	Finance Charges	Currency	Invoice Only
	Other Fees	Currency	Invoice Only
	Credits & Adjustments	Currency	Invoice Only
	Previous Payment	Currency	Invoice Only
	Previous Payment Date	Date	Invoice Only
	Payment Due Date	Date	Invoice Only
	Late Payment Date	Date	Invoice Only
	Current Balance	Currency	Account Summary Only
	Previous Balance	Currency	Account Summary Only
	Deposits & Investments	Currency	Account Summary Only
	Withdrawals & Debits	Currency	Account Summary Only
	Service Charges	Currency	Account Summary Only
	Interest & Dividends	Currency	Account Summary Only

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	<i>Previous Statement Date</i>	Date	Account Summary Only
	<i>Account Description</i>	Text	Account Summary Only
	<i>Current Period Yield</i>	%	Account Summary Only
	<i>Year to Date Yield</i>	%	Account Summary Only

e. **INF - Statement Index**

One record for each *Statement*, containing:

Key	Field	Type	Comments
	<i>Statement Descriptor</i>		See <i>Statement Descriptor</i> , above
	<i>Status</i>		For ESP use only. Used during <i>Statement Generation</i> to control the processing of the <i>Statement</i> . It is one of the following: <ul style="list-style-type: none"> • <i>Awaiting Processing</i> • <i>Awaiting Template</i> (from ePay Switch) • <i>In Generation Queue</i> • <i>Template Error</i> • <i>Data Error</i> • <i>Generated</i> • <i>Archived</i>
	<i>Fully Rendered Statement PDF File Name</i>		for ESP & CSP use
	<i>Generation Date</i>	Date	Date that the <i>Statement</i> was generated.
	<i>Pull Date</i>	Date	Date that the CSP took delivery of <i>Statement</i>
	<i>Push Date</i>	Date	Date that <i>Customer</i> downloaded <i>Statement</i>

f. **Statement Download Log**

If a *Statement Originator* has set the *Statement Delivery Notification Flag* on the *CSP Template/Originator Table* (see page 30) via the *UBF*, or on the *Statement Descriptor* (see page 42); an ADV message is sent to the *ESP Statement Origination Workstation* each time a *Statement* is *Pulled*, *Pushed*, or *Pulled & Pushed* by the CSP.

These messages are generated as part of *End-of-Day Processing* (see page 25).

i. **Pull**

The CSP *Pulls* a *Statement* by issuing the *Statement Download Req: Pull All* ADV to receive and manage all available *Statements*.

See *Statement Batches Solution* on page 72.

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II. Push

The CSP Pushes a *Statement* by downloading it to a *Customer*.

Sending this ADV is **REQUIRED** when the CSP chooses the *Statement Batches Solution*.

III. Pull & Push

The CSP can *Pull & Push* at the same time. The *Statement Download Req: Pull & Push* ADV is used to request *Statements* one at a time.

See *The Individual Statements Solution* on page 71.

This log file will be made available to the SSP for query purposes.

	Field	Type	Comments
Key	SSP Biller ID	Text 12	SSP-assigned number, unique for SSP
Key	CBAN	Text 12	How the <i>Statement Originator</i> knows the <i>Customer</i>
Key Dec	Payment Due Date	Date	Payment Due Date of <i>Statement</i>
	Generation Date	Date	Date that the <i>Statement</i> was generated.
	Pull Date	Date	Date that the CSP took delivery of <i>Statement</i>
	Push Date	Date	Date that <i>Customer</i> downloaded <i>Statement</i>

6. Transmission Data

a. Transmissson Index

For each *Statement Content Record* Transmission from SSP to CSP, a *Transmission Index* is sent to the *ESP Archive* mailbox.

The *Transmission Index* is used by *ESP Archive* to determine which transmission contains an individual *Customer's Statement*.

	Field	Type	Comments
Key	Template ID	Text 12	Template # + "v" + Template Version # E.g.: T0040456v0051
Key	CBAN	Text 12	How the <i>Statement Originator</i> knows the <i>Customer</i>
Key	Statement Cycle Date	Date	
Alt Key	SSP ID	Text 7	SSP ID + Transmission Number form unique key
Alt Key	Transmission Number	Long	
	UBF Biller ID	Text 12	Unique Visa-assigned number
	CSP ID	Text 7	"C" & Unique Visa-assigned number
	Record Count	Integer	Number of records in this Transmission

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b. Transmission Log

For each transmission sent by *SSP*, *CSP*, or the *ePay Switch*, a *Transmission Log* record is generated.

This Log kept by the transmitter and is used to detect duplicate transmissions.

	Field	Type	Comments
Key	Destination	Text	"To" line of mail message
Key	Title	Text	From "Subject" line of mail message
Key	Hash	Long	Hash total for message
	Transmission Number	Long	
	Transmission Date	Date	
	Record Count	Integer	Number of records in this Transmission

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E. ESP's Processes

1. The ESP Template Authoring Workstation

The *ESP Template Authoring Workstation* is used to generate and maintain *Statement Templates*. It is operated by the SSP in conjunction with the *ESP Statement Origination Workstation*.



It is a Visual Basic program which calls Microsoft Access to define and update the Access Report and SubReports that make up the *Statement Template*. All *Template* development, including *SAR Stream Parsing* and Report definition is done using Access.

See page 15 for a description of the contents of the *Statement Template*.

Generation of a new *Statement Template* will include the following steps:

- a) Request a new *Statement Template Number* from the *ePay Switch*.
- b) Define the *Statement Content Tables*: the tables and their fields needed to store the data of the Statement. This is done using an Access Wizard to generate Access Tables (Development may be deferred).

Statement Content Tables' names contain the *Statement Template Number* and the *Template Version Number* of the *Template* where they were defined.

For example, *Template T1234567v0123* may contain tables *T1234567v0123*, *T1234567v0100_Service*, *T1234567v0020_ATT*, *T1234567v0003_MCI*, etc.

Table *T1234567v0099_Service* would be obsolete and automatically deleted from *ESP Statement Generation Workstations* when its last data is purged.

- c) Map the *SLR Stream* to the *Statement Content Tables*. The VB program reads the Access Tables and shows a Form which allows the user to define the mappings via drag-and-drop, depending upon the type of *SAR Stream* (SQL Table, Fixed-length, Delimited, or Print Image) (Development may be deferred).
- d) Generation of the Transmission Format mapping is automatic (Development may be deferred).
- e) Enter both typical and pathological *Test Data*. These data will be used to develop and test the *Statement Template*. Different conditions can be developed with data for several different months.

See *ESP Test Mode* on page 71.

- a) Write the Access Report, using the Test Data to verify that the Report meets the *Statement Originator's* expectations.

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- b) Place the new *Statement Template* onto **Test Service** with the *ePay Switch* (ref: *Statement Template in Test Service Req ADV* on page 36). If the Switch reports any errors, resolve them and re-load.
- c) Sign-on to the various CSP Test Accounts and terminate and activate the Statement. Examine the test results.
- d) Once the Template produces the required results, place the new *Statement Template* onto **Service** with the *ePay Switch* (ref: *Statement Template in Service Req ADV* on page 36).

Maintenance of existing *Statement Templates* is done in essentially the same way.

a. Data Stored

The current *Statement Template MDB File*, *Statement Stationary*, and any other binary resources needed for *Statement* generation, such as fonts, Generic Enclosures, etc. In addition, a copy of the *Standard Template* should be kept on hand.

b. Processes

- i. Request a new *Statement Template #* from the *ePay Switch*. This will be done via the *ESP Statement Origination Workstation*.
- ii. Remove a *Statement Template* from **Service**. This will be done via the *ESP Statement Origination Workstation*.
- iii. Display a *Statement* in final form from the test data.
- iv. Define the *SAR Parsing Table*.
- v. Define the *Transmission Parsing Table* (will be automatic).
- vi. Assemble the *Statement Resource Set*, including the *Statement Stationary*.
- vii. Define the Report and SubReports.
- viii. Place a *Statement Template* into **Test Service**. This will be done via the *ESP Statement Origination Workstation*.
- ix. Place a *Statement Template* into **Service**. This will be done via the *ESP Statement Origination Workstation*.
- x. Place a corrected version of a *Template* into **Service**.

c. Hardware

- i. Pentium PC with 32 mB RAM, 2GB hard disk, floppy, backup device, CD-ROM, 28.8 kbs modem, keyboard, mouse, 17" monitor and sound system.
- ii. LAN Connection with *ESP Statement Origination Workstation*.

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d. Software

- i. Operating System: Windows NT Workstation.
Win16 operating systems such as Microsoft Windows for Workgroups® are not acceptable, since they cannot run the software needed.
- ii. Microsoft Access v7.0.
- iii. Desktop Publishing program capable of generating *Statement Stationary* and bitmaps.
CorelDRAW and Micrografx Designer vector-based files can be used by Access directly and will both save transmission size and improve final appearance.
- iv. Adobe Exchange® v3.0
- v. Visa's *ESP Template Authoring Workstation* software.

2. The Standard Statement Rendering Tool

Software designed to generate a *Statement* using the *Template*, and data from one of four sources:

1. Test data from within the *Template*,
2. "Production" data from our SQL Server database on the *Statement Generating Workstation*, and
3. "External" data residing in an ODBC compliant database under the control of a CSP or SSP's Customer Service Group,
4. Archived data residing on a CD.

This tool is part of the *ESP Template Authoring Workstation*, the *ESP Statement Origination Workstation*, and the *ePay Switch*.

Given a *Template ID*, *CBAN*, and *Statement Cycle Date*, it will generate a *Full Rendered Statement PDF File* and display it to the operator, using the same engine to generate the PDF File as is used in the *ESP Statement Generation Workstation*.

The operator of the *ESP Template Authoring Workstation* uses this tool to certify new *Templates*. The *Statement Originator* can use it for Customer Support calls. Visa Research can use it, in conjunction with the *ESP Archive* data store, to re-create any *Statement* ever passed through the *ESP System* (subject to data availability).

3. The SSP's System

The SSP's System will be responsible for two new functions:

- Provide *SAR Stream* data for *Statements* to be processed by ESP (as defined by the *Statement Originator* and the *Customer*), with necessary header information.
- Receive *Admin. Messages (ADV)* from the BS



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ESP Workstation.

Note that The SSP's System is outside the scope of the ESP Project. It is the property of the SSP, not Visa.

LAN or other connection is transparent to the operation of Visa's software, since the interface consists of the exchange of ASCII "flag files" only.

Verification of "Customer Statement Delivery Req" and "Customer Statement Delivery Termination Req" ADV messages is controlled by the *Customer Sign Up* field of the *SSP* on page 29:

- "A" means that all *Customers* can sign up.
- "B" means that *SSP* will confirm *Customer* sign up verification.

a. **Data Stored**

- i. *Statement Legacy Records (SLR)*. Received from *Statement Originator*. Only those *SLR's* indicated by entries in the *Customer Profile Table* are included. (see page 41). Some *Statements* are removed from the main print stream, and some are duplicated there, depending upon values in the *Customer Profile*.

If the *Statement Originator* does not have a valid *Template* in service, the records for his *Statements* cannot be parsed and passed on to the rest of the *ESP System*. Instead, they will be spooled to a disk file as they are received. Since the *Workstation's* storage is limited, correcting this condition quickly is of great importance.

- ii. *Statement Legacy Records, Augmented (SAR)*. Produced from *SLR*, using *Customer Data*

SSP Customer Profile Table (see page 39) and *Template Data*

Template Index Table (see page 41).

- v. *Customer Profile* (as described on page 29, but using *SSP Biller ID*, instead of *UBF Biller ID*).

- vi. *Template Data*

Template Index Table (see page 41).

- viii. *Administration Messages, Visa Format (ADV)*. (see page 28).

b. **Processes**

- i. **Receive *SSP Customer Profile Table* and *Template Index Table* from *ESP Statement Origination Workstation*.**

This new process will be developed by the *SSP*. The *SSP Customer Profile Table* could also be maintained by the *SSP*.

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ii. **Receive Statement Originator_Xref_Table from ESP Statement Origination Workstation.**

This new process will be developed by the SSP.

iii. **Receive SLR Records from Statement Originators.**

This is an existing process, and is not affected by this project.

iv. **Split SLR Records**

Split those *SLR Records* representing *Statements* bound for *ESP* from the main print stream, based upon the *Customer Profile Table*.

This new process will be developed by the SSP.

v. **Augment SLR Records to SAR format.**

This new process will be developed by the SSP.

The details of this process depend greatly upon the format of the *SAR Records* and the *SSP's* data processing environment.

Template_Number and *Template_Version_Number* will be added to each *Statement Record Set*. The *Template_Version_Number* will be checked by the *ESP Statement Origination Workstation*.

This new process will be developed by the SSP.

vi. **Transfer SAR Records to ESP Statement Origination Workstation.**

This will be done in the form of a copy of files to and from a given set of subdirectories, either via a network or other file-transfer medium.

This new process will be developed by the SSP.

vii. **Transfer ADV File to ESP Statement Origination Workstation.**

This will be done in the same manner as *SAR Records*.

This new process will be developed by the SSP.

viii. **Receive Administration Messages (ADV)**

Receive *Administration Messages, Visa Format (ADV)*, with *Control Total File* from *ESP Statement Origination Workstation*.

This new process will be developed by the SSP.

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ix. Send Administration Messages (ADV)
Send Administration Messages, (ADV), and Control Total File from ESP Statement Origination Workstation.

x. Process Control Total File.

This new process will be developed by the SSP.

When urgent or routine messages are received (as noted by "Pass on to SSP" comments), the SSP's operator must perform some action.

xii. Process Administration Messages (ADV)

(a) Receive ADV: Customer Statement Delivery Req

Request *Statement Originator's* OK

If *Statement Originator* rejects then

Return Customer Statement Delivery Nak

with error message

Else If this is a SSP's Test Customer Account

Return Customer Statement Test Delivery Ack

Else Return Customer Statement Delivery Ack

End If

Request Statement Originator's OK

If Statement Originator rejects then

Return Customer Statement E

with error message

Customer Profile

Return Customer Statement Delivery Ter

and If

②

Receive ADV: *Statement not Pushed by Due Date*
Take appropriate Customer Service action.

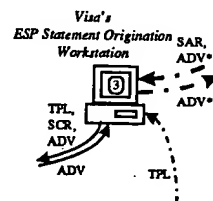
Any: PC, minicomputer, mainframe, or combination.

d. Software

- i. Any LAN that can communicate with Windows NT Server. e.g.: UNIX TCP/IP, IBM SNA®, Novell Netware®, Windows NetBEUI®, Appletalk®, DECnet®, etc.
- ii. Any operating system that can copy files to and from a given subdirectory on a Windows NT Server.

4. The ESP Statement Origination Workstation

The *ESP Statement Origination Workstation* performs three main functions: it passes *Template* transactions between the *Template Authoring WS* and the *ePay Switch*, it processes an *SAR Stream* and passes it to the *ePay Switch*, and it passes and processes *Administration Messages*.



An *ESP Statement Origination Workstation* is identified by an *SSP_ID*. If the same *Statement Service Provider* is operating from more than one site, with more than one *ESP Statement Origination Workstation*, then two separate *SSP_IDs* will have to be used. In addition, each *Statement Originator* is identified by a *UBF Biller ID*. If they are originating *Statements* from more than one *SSP* site, then they will need more than one *UBF Biller ID*.

a. Data Stored

- i. Each current *Statement Template* (*.mdb file) defined for the *SSP's Statement Originators* must be kept for local processing.
- ii. *Template Data*
Template Index Table (see page 41). Used to add *Template_Version_Number* to *SAR Records*.
- iv. *Statement Originator Cross-Reference Table* (see page 28), a cross-reference between the *SSP's Biller_ID's* and *Visa's UBF Biller ID's*. Used to reformat *SAR Records* for transport.
- v. *The Customer Data*
SSP Customer Profile Table (see page 39), maintained by this workstation.
- vii. *SAR Records* awaiting parsing and transport.
- viii. *Statement Content Records*, parsed from *SAR Records* and awaiting transport.
- ix. *Control Total File* containing transmission control totals for auditing.

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b. Processes

Notes: Req = Request,
Ack = Acknowledgment,
Nak = Negative Acknowledgment

I. Receive SAR Records from the SSP's System.

Convert SSP's *Biller ID* to *UBF Biller ID*. See page 41.

Current plans call for this to be one of the following:

- When *SAR Records* are presented in SQL Tables, they are copied into files of comma-delimited records. One file for each *Statement Content Table*, with the table name as filename, and with one variable-length record for each table record.

An accompanying *Control Total File*, consisting of one record for each of the data files, showing record count and hash totals, must be included. This file's records will be compared against the files received, and any differences will be reported.

- When *SAR Records* are in other formats, the records themselves are presented. Transmission Control Files will have to be worked out with each SSP.

These files will be copied into a given subdirectory on the *Workstation*.

II. Parse the SAR Records into Statement Content Records for Transmission.

This will be done using the *SAR Parsing Table* within the *Statement Template*. It is an entirely table-driven process, with NO code specific to the *Statement Templates* being processed.

In the case of SQL Table-based *SAR Records*, this will mainly consist of adding the *Template_Version_Number* and *UBF Biller ID* and *CSP_ID* from the *SSP Customer Profile Table*.

Since the *SSP* has a vested interest in the fidelity of the *Statement* (after all, the *Statement Originator* is his *Customer*!), any labor-intensive or sophisticated processing should be here, rather than at the *ESP Statement Generation Workstation*.

SAR Records for a single *Statement_Template_#* will be sorted and processed in order of *CSP_ID*.

III. Collect Statement Content Records by Destination

As *Statement Content Records* are received, they are copied to ASCII file sets, one set for each destination *CSP*. Each set consists of one file for each *Statement Content Table* in the set.

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When a pre-determined number of *Statements* (say 100) are represented in any one file set, or when *Statement Content Records* are received for a new *Template*, that set is transmitted to its destination *CSP*, via the *ePay Switch*, and the ASCII files are emptied.

iv. **Transmitting *Statement Content Records* to the *CSP* via the *ePay Switch*.**

Each *Statement Content Record Set* (i.e.: the records for one *Statement*) take part in three transmissions: the *Statement Content Record Message*, the *Transmission Index Message*, and the *Transmission Control Message*.

(a) **The *Statement Content Record Message***

Each ASCII file of the *Statement Content Record Set* is included in the Message as an Enclosure.

See the *SCR - Statement Content Records* portion of *ESP System's Data Transmissions* on page 42.

Total record counts are added for each file, and a hash is performed on the CBAN field of the "main" file.

The CBAN field is chosen for the hash field because it is a required field for all Statements - see *Statement Descriptor* on page 42.

A copy of the *Statement Content Record Message* is sent to mailbox *ESP Archive*, where it is stored for Visa Research.

(b) **The *Transmission Index Message***

The *Transmission Index Message* is a cross-reference to the CBANs within a *Statement Content Record Message*. It is used by Visa Research to determine which *Statement Content Record Message* contains the Statement data for a given *Customer*.

See the *Complex Administrative Messages* portion of *ESP System's Data Transmissions* on page 42.

(c) **The *Transmission Control Message***

EVERY message sent via the *ePay Switch* must produce a corresponding record sent to the mailbox *ESP Transmission Control*. In addition, when ANY message is read from the *ePay Switch*, a corresponding record must be sent to *ESP Transmission Control*.

Thus, *ESP Transmission Control* acts as a clearinghouse of messages, ensuring integrity and timeliness.

See the *Simple Administrative Messages* portion of *ESP System's Data Transmissions* on page 42.

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v. **Receive and Process Administrative Messages (ADV) from the SSP's System**

A Control Total File will be needed in all cases.

- (a) **Receive ADV: Customer Statement Delivery Ack**
Create BS Customer Profile
Send ADV to CSP
- (b) **Receive ADV: Customer Test Statement Delivery Ack**
Create BS Test Customer Profile
Send ADV to CSP
- (c) **Receive ADV: Customer Statement Delivery Termination Ack**
Update BS Customer Profile Termination Date
Send to Customer
- (d) **Receive ADV:**
Customer Statement Delivery Nak
Customer Statement Delivery Term. Nak
Send ADV to Customer

vi. **Process Administrative Messages (ADV) from SSP**

- (a) **Receive ADV:**
ANY "Statement Template ... Request"
Statements Not Downloaded List
End-of-Day Transmission Query
Send to ePay Switch

vii. **Process Administrative Messages (ADV) from ePay Switch**

- (a) **Receive ADV: Customer Statement Delivery Req**
If Customer Sign Up = "B" then
Pass on to SSP

ElseIf Customer Sign Up = "A" then
Create SSP Customer Profile record
Send Customer Statement Delivery Ack
to Customer

End If
- (b) **Receive ADV: Customer Statement Delivery Termination Req**
If Customer Sign Up = "B" then
Send to SSP

ElseIf Customer Sign Up = "A" then
Update SSP Customer Profile record
Send Customer Statement Delivery Termination
Ack to Customer

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End If

- (c) Receive ANY "Statement Template ... Ack/Nak" ADV

Send to *ESP Template Generation Workstation*

- (d) Receive ADV:
Statement Template Expires next Month
Statements Not Downloaded List
End-of-day Statement Transmission List
 Report to operator.

- (e) Receive Transmission Received from ePay Switch ADV
 Delete Message from "Sent" mailbox.

viii. **Pass Statement Templates and Admin. Messages from The Template Authoring Workstation to the ePay Switch.**

This will be a simple bi-directional pass-through, with the exception that a copy of all *Templates* currently in service for the SSP will be retained.

Each receipt and transmission will be recorded in the *Control Total File*.

ix. **Send Administrative Messages (ADV) to ePay Switch**

Transmissions will be made at pre-determined intervals (e.g.: once a day, when 100 messages have accumulated, etc.).

x. **End-of-Day Processing**

See *End-of-Day Processing* on page 25.

Local traffic control reports will be generated. Details of their design have yet to be determined.

xi. **System Management Functions**

All messages generated by the ESP System for attention of *SSP Operations* will be sent to a modular error handler. This error handler can be configured to deliver its messages in one of several different ways: by the SSP's internal e-mail, by FAX, or to the *ESP Statement Origination Workstation* monitor.

c. **Hardware**

- i. Windows NT "cluster" with one or more Intel-based servers to execute Visual Basic code.

May range from a single Pentium® PC to a group of heavy-duty Windows NT servers. A significant portion of the server cluster must be Intel-based to execute Visual Basic code.

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A minimum system would consist of: Pentium Pro PC, 96MB of RAM, 8GB RAID 5 disk array, CD-ROM, keyboard, mouse, 17" monitor, sound system, backup hardware, Windows NT compatible communications hardware (e.g.: telephone, modems, ISDN lines, dedicated lines, etc).

- ii. LAN connection to *SSP's System*
- iii. Connection to *ESP Template Authoring Workstation*.
May be LAN or "sneaker-net".
- iv. Microsoft Exchange Server remote connection to *ePay Switch*.

d. **Software**

- i. Windows NT Server.
- ii. *Visa's ESP Statement Origination Workstation* software.
- iii. Microsoft Exchange Client.
- iv. Microsoft SQL Server.
- v. Adobe Exchange.

5. The ePay Switch

The *ePay Switch* is a Visa resource, and will be initially operated from Visa's San Mateo facilities. Unlike the *ESP Template Authoring Workstation* and the *ESP Statement Origination Workstation*, it deals with ALL *SSP's*, and ALL *CSP's*.

It has four primary tasks:

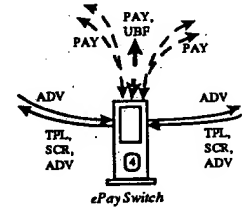
- i. Move *Statement Content Records* from *SSP* to *CSP*.
- ii. Move *Administration Messages (ADV)* from *CSP* and *SSP* and visa-versa.
- iii. Store, validate, and log *Statement Templates*, and supply them to *Statement Generation Workstations*.
- iv. Move *Payment Messages* from *ePay BBWS* and *OWS Workstations* to *Visa's Base II* and visa-versa (outside the scope of the *ESP Project*).

This must be done with the highest standards of integrity and reliability.

a. **Hardware**

- i. A Windows NT "cluster"

The *ePay Switch* will have significantly higher communications throughput than any other part of the system, since it will serve the entire *ePay* system, not just *ESP*.



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A significant portion of the cluster will have to be Intel-based servers for the execution of Visual Basic code.

- ii. Connection to ALL *ESP Statement Origination Workstations*, *ESP Statement Generation Workstations*, and *ePay BBWS* and *OWS Workstations*.
- iii. LAN connection to a *Visa Base II VAP v10.2* or higher (outside the scope of the ESP Project).

b. Software

- i. Operating System: Windows NT Server.
- ii. Microsoft Exchange Server®
- iii. Visual Basic run-time with MAPI connection to the Exchange Server, and with Jet or Microsoft SQL Server® database.
- iv. Visa's *ESP ePay Switch* and *ESP Template Management* software.

c. Data Stored

- i. All *Statement Templates* defined in *ESP* (see page 15).
- ii. *Universal Biller File (UBF)* (see page 28).
- iii. *Statement Originator Xref Table* (see page 28).
- iv. *Template Data*
Template Index Table (see page 41).
- vi. *Control Total Files* for all traffic routes.
- vii. All messages sent or received, in off-line storage for 180 days.

d. Processes

Notes: Req = Request,
Ack = Acknowledgment,
Nak = Negative Acknowledgment

- i. In conjunction with *ESP Template Authoring Workstations*, via *ESP Statement Origination Workstations*:

- (a) Receive ADV: *New Statement_Template_# Req*
Generate & record a new *Statement_Template_#*.
If OK then
Return *New Statement_Template_# Ack*
with new *Statement_Template_#* to SSP
Else
Return *New Statement_Template_# Nak* to SSP
End If

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(b) Receive ADV: Statement Template in Test Service Req

Check *Template*. Note that this can be a new updated *Template*. This will be a largely manual process, involving checking the *Template* for syntactical and functional correctness, not for making editorial comments.

In some instances, the turnaround time for this checking procedure will be critical to the successful delivery of *Statements*. In those cases, Visa has pledged to expedite this process.

If OK then

Move *Template* to Test Download Area

Return *Statement Template in Test Service Ack* to SSP

Else Return *Statement Template in Service Nak* with Errors Found to SSP

End If

(c) Receive ADV: Statement Template in Service Req

Check *Template*. Note that this can be a new updated *Template* (see note above re Checking a *Template*).

If OK then

Move *Template* to Download Area

Return *Statement Template in Service Ack* to SSP

Else Return *Statement Template in Service Nak* with Errors Found to SSP

End If

(d) Receive ADV: Stmt Template Deactivate Req

If Date in future then

Set *Template Expiry Date*

Return *Statement Template Deactivate Ack* to SSP

Else Return *Statement Template Deactivate Nak* to SSP

End If

(e) Receive ADV: Statement Template Expires next Month

Send *Statement Template Expires next Month* to SSP

ii. In conjunction with **ESP Statement Origination Workstations:**

- (a) **Transfer Statement Content Records.**
- (b) **Transfer the following Administration Messages (ADV) to ESP Statement Generation Workstations:**
Customer Statement Delivery Ack/Nak
Customer Statement Delivery Term Ack/Nak
Statements Not Downloaded Since Date Query
- (c) **Receive ADV: Records received from ePay Switch**
Receive ADV: Records sent to ePay Switch
 Save record counts for auditing

iii. **End-of-Day Processing**

See *End-of-Day Processing* on page 25.

System-wide traffic control reports will be generated and portions will be sent to the various workstations. Details of their design have yet to be determined.

Billing reports will also be generated.

iv. In conjunction with **ESP Statement Generation Workstations:**

- (a) **Transfer Statement Content Records.**
- (b) **Transfer the following Administration Messages (ADV) to ESP Statement Origination Workstations:**
Customer Statement Delivery Req or
Customer Statement Delivery Termination Req
Statements Not Downloaded Since Date List
- (c) **Receive ADV: Stmt Template Download Request**
Send Template
- (d) **Receive ADV: Records received from ePay Switch**
Receive ADV: Records sent to ePay Switch
 Save record counts for auditing

v. **Download UBF from Base II**

Only an extract of the full UBF is downloaded.

vi. **Transfer Payment traffic for the Customers' Bank's ePay Origination Work Station and the Billers' Bank's ePay BB Workstation.**

Note that this is outside of the scope of the ESP Project.

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vii. Mailboxes:

- One for each SSP ID = SSP ID (starts with "B").
- One for each CSP ID = CSP ID (starts with "C").
- *ESP Statement Template Control*
- *ESP Archive*
- *ESP Transmission Control.*
- *ESP Statement Templates* - a public folder for downloads.
- *All CSPs for Template*

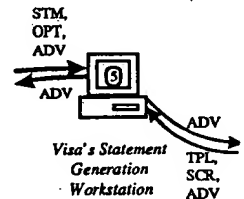
viii. Mail Robots

Mail Robots (Visual Basic programs with MAPI interfaces) watch certain mailboxes and process any messages arriving there:

- *All CSPs for Template*
Watches *All CSPs for Template* mailbox, and forwards message to all CSPs who have downloaded that *Template*.
- *Statement Template Control.*
Watches *Statement Template Control* mailbox.
- *Reconcile Transmission Control Files.*
Watches *Transmission Control* mailbox. Produces end-of-day reports on transmissions received and passed on.
- *ESP Archive.* Stores all Statement Content Record and Admin Messages transmissions for research.

6. The ESP Statement Generation Workstation

The *ESP Statement Generation Workstation* provides the CSP's Home Banking System with the *Statement PDF Files* and associated fielded data necessary to display a *Statement* on the *Customer's* PC. It also processes *Administrative Messages* and transfers them to the *ePay Switch*.



a. Data Stored

I. Statement Index (INF) - SQL Table

One row per Statement. Contains *Statement Index File* data. See page 42.

II. Statement Content Records (SCR) - SQL Tables

Note that the *Customer* can request *Statements* from prior *Billing Cycles* - for a pre-defined period of time (say 6 months).

This data is stored in tables within a Microsoft SQL Server® database, not within the *Template*, an Access database (*.mdb file). Each *Statement Template* has one or

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more different tables associated with it, so several thousand tables may be involved.

See page 39.

iii. **Fully Rendered Statement PDF Files**

Statements prepared for delivery to the *Customer* will be either fully rendered in a single PDF File, or will be shipped in Statement/Stationary pairs for caching and merging on the *Customer's* PC.

Initially, fully rendered PDF files will be produced because the technology to merge Statement/Stationary pairs on the *Customer's* PC is not yet in hand. This can be globally changed quite easily, once the *Customer PC* software has been developed.

One PDF per file. Filename is stored in the *Statement Index*.

See page 7.

iv. **Templates**

All Templates received from the *ePay Switch*. Each *Statement Template* will consist of an MDB file and one or more binary resource files such as bitmaps. These will be stored together in a separate subdirectory for each *Template*.

It is expected that a large CSP could accumulate several thousand Templates.

See page 15.

v. **Template List**

An ASCII version of the *Template Data*

Template Index Table (see page 41), containing a row for each *Template* in Service, whether on-site or not.

vi. **Optional Generic Enclosures Index - SQL Table**

vii. **Optional Generic Enclosures PDF Files**

viii. **Customer Profile Table**

See page 29.

ix. **Control Total File**

Contains transmission control totals for auditing. Generated here and transmitted to the *ePay Switch*.

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b. Processes

Notes: Req = Request,
Ack = Acknowledgment,
Nak = Negative Acknowledgment

I. Receive Statement Content Record (SCR) Data

Batches are received from the *ePay Switch*, parsed, and stored.

This will be done into SQL tables. It will be a high-volume batch process, done by an optimized Visual Basic program with little screen interaction.

II. Generate Statements in Batch Mode

All *Statements* received will be processed in batch mode.

This will be done by a Visual Basic Program which checks the *Statement Index Table* for newly received *Statements*.

See *Figure 33 - Generating the Fully-Rendered Statement* on page 4. For each new *Template*, the following processing is done:

1. If the *Template* is not available locally, it is fetched from the *ePay Switch*, any new fonts are loaded, and any other binary resources are extracted.
2. All *Statements* for that *Template* are generated, as follows:

- The *Customer-Specific Mandatory Statement* is generated via calls to Access as an OLE Automation Server, and is output as a PDF File.

At the same time, the *PDF Merge Control Table* (see page 16) is generated for this *Customer's Statement*. This is a list of PDF Files which must be appended to form the *Fully Rendered Statement PDF File*.

The first entry in this table is usually a *The Interactive Page PDF File* (see page 12).

- The PDF files specified in the *PDF Merge Control Table* are concatenated by Adobe Exchange, also called as an OLE Automation Server.

Once this is done, the Status of the *Statement* is upgraded to "Generated".

As volumes increase, *Statement Generation* will be off-loaded to dedicated Windows NT Workstations, attached to the *ESP Statement Generation Workstation* by LAN. The Distributed Two-Phase Commit feature of Microsoft's SQL Server will make this possible.

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iii. Purge Statements

Each day, all Statements more than x months old are purged from the system.

iv. Receive Administrative Messages from CSP

(a) Customer Statements Available Query

Query *Statement Index* to an ASCII file.

Selection criteria is *UBF Biller ID* and *CBAN OR CSP Account Number*.

Return "*Customer Statements Available List*" message, pointing to ASCII file.

(b) Statement Download Request: Pull All

Send pointers to ALL *Statements* that have not been already downloaded. Record *Pull Date* for all of these *Statements*.

(c) Statement Download Push

ADV contains *Template ID*, *CBAN*, and *Statement Cycle Date*.

Record *Push Date* for of this *Statement*

If the *Statement Delivery Notification Flag* of

SSP (see page 29) is set

OR the *Statement Delivery Notification Flag* of

Statement Descriptor (see page 42) is set

Then

Generate *Statement Pushed ADV*

(d) Statement Download Request: Pull & Push

Send pointer to a SINGLE *Statement*. The CSP is replying to a *Customer's* request and will *Push* the *Statement* immediately. Record *Pull Date* and *Push Date* for of this *Statement*.

ADV contains *Template ID*, *CBAN*, and *Statement Cycle Date*.

If *Statement* has been generated then

Return "*Statement Download Pointer*"

message, pointing to a *Fully Rendered Statement PDF File*.

If the *Statement Delivery Notification Flag* of SSP (see page 29) is set

OR the *Statement Delivery Notification Flag* of

Statement Descriptor (see page 42) is set

Then

Generate *Statement Pushed ADV*

End If

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Else If *Statement PDF File* has been purged, but the data is still available then
 Re-generate the PDF File
 Return "*Statement Download Pointer*" message, pointing to a *Fully Rendered Statement PDF File*.

If the *Statement Delivery Notification Flag* of SSP (see page 29) is set
 OR the *Statement Delivery Notification Flag* of
Statement Descriptor (see page 42) is set
 Then

Generate *Statement Pushed ADV*

End If

Else Return "*Statement Download Nak*" message with an error message.

(e) **Optional Generic Enclosures Download Request**

If the *Optional Enclosure PDF File* is available then
 Return "*Optional Generic Enclosures Download Pointer*"
 Else Return "*Optional Generic Enclosures Download*"
Nak message with an error message.

(f) **Customer Statement Delivery Req**

Edit options selected against CSP (see page 29). If OK, Pass on to *ePay Switch*. If NOT OK, report error to Visa - this is contrary to ESP Operating Procedures.

(g) **Receive other ADV from CSP**

Pass on to *ePay Switch*.

v. **Receive ADV from ePay Switch**

(a) **Customer Statement Delivery Ack**

Update *Customer Profile* and pass on to CSP.

(b) **Customer Statement Test Delivery Ack**

Update *Customer Profile* with *Test Account Flag* set and pass on to CSP.

(c) **Customer Statement Delivery Termination Ack**

Delete *Customer Profile* record and pass on to CSP.

(d) **Transmission received from ePay Switch**

Delete Message from "Sender Archive" mailbox.

(e) **Other "Ack" or "Nak" ADV**

Pass on to CSP.

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(f) **Statements not Downloaded Query**

Generate and return "Statements Not Download List" ADV.

vi. **End-of-Day Processing**

See *End-of-Day Processing* on page 25.

Local traffic control reports will be generated. Details of their design have yet to be determined.

c. **Hardware**

- i. A Windows NT server or server cluster. Unlike the other portions of the ESP system, the *Statement Generation Workstation* will devote a significant portion of its time to the generation of Access Reports. This will require one or more Intel-based servers.

A typical system would include: Pentium Pro PC, 96mB RAM, 10 to 50GB RAID 5 disk array, CD-ROM, keyboard, mouse 17" monitor, sound system, communications hardware, backup hardware.

- ii. RAS connection to *ePay Switch*.
- iii. LAN connection to host CPS's HBS.

d. **Software**

- i. Windows NT Server.
- ii. Microsoft Exchange Client.
- iii. Microsoft SQL Server®.
- iv. Microsoft Access
- v. Adobe Exchange®
- vi. Visa's ESP Statement Generation Workstation software.

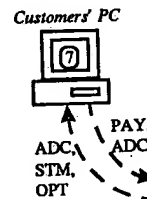
7. **The Customer's PC**

Note that *Customer's PC* is outside the scope of the ESP Project. The hardware is the property of the Customer and the software is specified or provided by the CSP.

The Customer's PC communicates with the CSP either via the Internet, Intranet, or a proprietary network. Proprietary network connections can be either on-line or off-line.

In all cases, the free Adobe Reader is used to display the *Statement*.

Future plans call for downloading of the *Statement* in *Statement/Stationary PDF Sets*, with the *Stationary PDF Files* being cached on the Customer's



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PC.. This would offer significant performance advantages over downloading fully rendered PDF files.

See *Downloading unchanging Statement elements to the Customer's PC is Inefficient* on page 82

These plans are made less urgent by advances in Adobe PDF file compression and downloading strategies.

a. Kinds of Customer PC Software

The following kinds of PC Software systems are anticipated: HTLM/Internet, HTML/Intranet, Proprietary On-line and Proprietary Off-Line.

i. HTLM/Internet

This is the standard World-Wide-Web based system.

ii. HTML/Intranet

As for HTML/Internet, but with a private dial-up network for added security.

iii. Proprietary On-line

CSP's application software, written to run while connected to the CSP's System.

iv. Proprietary Off-Line

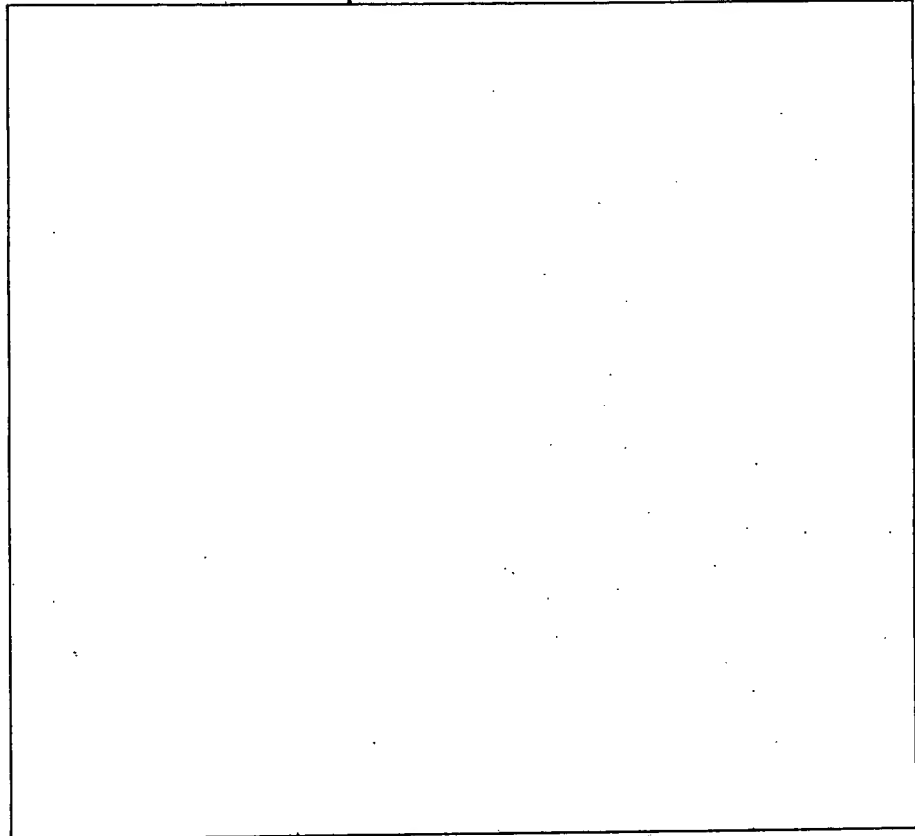
CSP's application software, written to run while NOT connected to the CSP's System. Data transfer is controlled by batch queues, which control transmission once communication is established.

b. Data Stored

Fully Rendered Statement PDF Files.

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c. Processes

i. Request a list of *Statements* available for *ESP*.Figure 9 - A Mock-up of a *Statements* List

Notes:

- This is a mock-up of a *CSP's* offering to its customers, and is outside the scope of the ESP System.
- The underlined words are Web links to start or stop downloading of a *Statement*.
- This design is copied from the local Yellow Pages. Much opportunity exists for *CSP's* to improve on this layout.

Please note that this a conceptual mock up only.
The final item may differ significantly from this figure.

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- II. Select a new *Statement* for *ESP*.
- III. Request Termination of Delivery of an existing *Statement*.
- iv. Request a list of *Statements* currently available for Downloading.

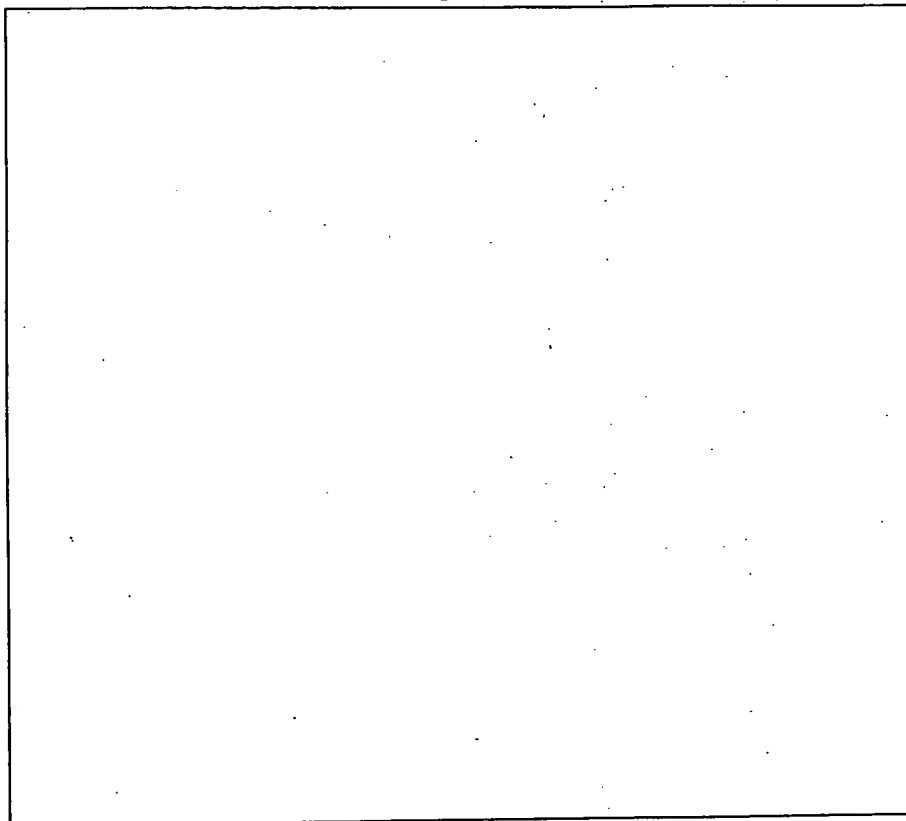


Figure 10 - A Mock-up of a Statement Download Form

Notes:

- This is a mock-up of a *CSP's* offering to its customers, and is outside the scope of the *ESP System*.
- The underlined words are Web links to download a *Statement*.
- Suzie paid her September Sears statement by check, so the payment is not recorded here. Note that recording of ePay payments would be a *CSP* function outside the scope of the *ESP System*.
- *CSPs* may choose many other layouts. For example, access historical documents may be from another Web-page, reached through a button or menu item.

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v. **Request that a single *Statement* be Downloaded.**

For a mock-up of a *Statement* as it could be presented to a *Customer*, see *The Statement* on page 7.

vi. **Request an *Optional Enclosure*.**

vii. **Request *Payment* of a *Statement***

This is outside the scope of the ESP Project.

d. **Hardware**

Any PC, Macintosh®, or Unix workstation.

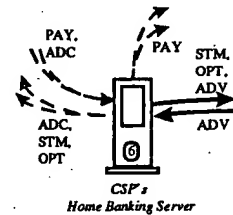
e. **Software**

If the CSP is WWW based, any web browser that supports Adobe Reader Plug-ins. If the CSP is not WWW based, CSP's home banking software, which must support Adobe's Reader.

8. **The CSP's Home Banking System (HBS)**

Note that *The CSP's Home Banking System* is outside the scope of the ESP Project. It is the property of the CSP, not Visa.

The CSP's Home Banking System (HBS) will pass Admin. Messages and Statements between the Customer and the ESP Statement Generation Workstation.



Visa's ePay System will receive payment, outside the scope of the ESP Project.

a. **Methods of Operation**

Two methods of operation are offered: individual *Statements* and *Statement* batches. With *The Individual Messages Solution*, ESP provides management of *Statements* and *Optional Enclosures* in a single, unified manner; while the *Statement Batches Solution* allows the CSP to manage *Statements* and *Optional Generic Enclosures* in the manner best suited to their needs.

Please note that the *Individual Statements Solution* still requires that all incoming Statement Content Records be processed in batch mode, and that the *Statement Batches Solution* does not prohibit the use of individual *Statement* requests, especially for prior-period *Statements*.

i. **The Individual Statements Solution**

Communication between CSP's Home Banking System and the ESP Statement Generation Workstation (SGen) is in the form of ADV messages.

Queries are generated by the CSP in response to *Customer* requests.

Since these messages are originated by the *Customer*, who is waiting for their reply, they must be processed in real time at the highest priority.

(a) **The Query**

The following ADVs are used:

- *Statement Download Req: Pull & Push*
- *Optional Details Download Req*
- *Optional Enclosure #x Download Req*

Note that "*Pull & Push*" refers to the fact that the *Statement* is *Pushed* to the *Customer* at the same time that it is *Pulled* by the CSP.

(b) **The Response**

Responses returned by SGen are in the form of messages containing filenames pointing to files on the Workstation.

The following ADVs are used:

- *Statement Download Pointer*
- *Optional Details Download Pointer*
- *Optional Enclosure #x Download Pointer*

II. Statement Batches Solution

Communication between CSP's *Home Banking System* and the *ESP Statement Generation Workstation* (SGen) is in the form of ADV messages.

SGen's response can be triggered in one of two ways: by completion of processing of a batch of newly-arrived *Statement Content Records*, or by receipt of a *Statement Download Req: Pull All* ADV.

The first trigger is enabled by a parameter in SGen's initialization file.

(a) **The Query**

Queries are generated by the CSP in response to *Customer* requests. The following ADVs are used:

- *Statement Download Req: Pull All*

Note that "*Pull*" refers to the fact that the *Statement* is *Pulled* by the CSP.

(b) **The Response**

Responses returned by SGen are in the form of messages containing filenames pointing to files on the Workstation.

The following ADVs are returned, one for each item currently available but not previously reported:

- *Statement Download Pointer*

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- *Optional Details Download Pointer*
- *Optional Enclosure #x Download Pointer*

b. Data Stored

I. Customer Profile Table.

See page 29.

II. ESP Statement Originator Table.

See page 29.

III. Fully Rendered Statement PDF Files

The CSP may choose to store and distribute all *Fully Rendered Statement PDF Files* as they are generated, by issuing *Statement Download Req: Pull All ADV's*, or may leave that storage up to the *ESP Statement Generation Workstation* and issue *Statement Download Req: Pull & Push ADV's* when the *Customer* requests a *Statement*.

c. Processes

I. Customer Requests a list of Statements available for ESP.

Generate list from *ESP Template / Originator Table* (see page 29).

Selection criteria is *UBF Biller ID* and *CBAN OR CSP Account Number*.

II. Customer Selects a new Statement for ESP.

Send "*Customer Statement Delivery Req*" ADV.

Receive "*Customer Statement Delivery Ack*". Inform *Customer* that they are signed up. Update *Customer Profile*.

... OR ...

Receive "*Customer Statement Delivery Nak*". Inform *Customer* that their request has been denied and show accompanying reason.

III. Customer Requests Termination of Delivery of an existing Statement.

Send "*Customer Statement Delivery Termination Request*" ADV, with *Termination Date*.

Receive "*Customer Statement Delivery Termination Ack*". Inform *Customer*. Update *Customer Profile*.

... OR ...

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Receive "Customer Statement Delivery Termination Nak". Inform Customer that their request has been denied and show accompanying reason.

iv. **Customer Requests a Statement.**

(a) **Method of Operation: The Individual Statements Solution**

Send "Statement Download Req: Pull & Push" ADV with the following fields: Statement Template #, CBAN, & Statement Cycle Date.

Receive a Fully Rendered Statement PDF File (see page 7 for a definition) from the ESP Statement Generation Workstation, and pass it on to Customer.

(b) **Method of Operation: Statement Batches Solution**

Download Fully Rendered Statement PDF File previously received from the ESP Statement Generation Workstation, and pass it on to Customer.

v. **Customer Requests Optional Customer-Specific Pages.**

(a) **Method of Operation: The Individual Statements Solution**

Send "Optional Details Download Req" ADV with the following fields: Statement Template #, CBAN, & Statement Cycle Date.

Receive a Optional Customer-Specific PDF (see page 7 for a definition) from the ESP Statement Generation Workstation, and pass it on to Customer.

(b) **Method of Operation: Statement Batches Solution**

Download Optional Customer-Specific PDF previously received from the ESP Statement Generation Workstation, and pass it on to Customer.

vi. **Customer Requests an Optional Enclosure.**

(a) **Method of Operation: The Individual Statements Solution**

Send "Optional Enclosure #x Download Req" ADV with the following fields: Statement Template #, CBAN, Optional Enclosure Number & Statement Cycle Date.

Receive a Optional Enclosure PDF File (see page 7 for a definition) from the ESP Statement Generation Workstation, and pass it on to Customer.

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(b) **Method of Operation: *Statement Batches Solution***

Download *Optional Enclosure PDF File* previously received from the *ESP Statement Generation Workstation*, and pass it on to *Customer*.

vii. **Customer Requests Payment of a *Statement***

Outside the scope of the ESP Project.

d. **Hardware**

Any: PC, minicomputer, mainframe, or combination.

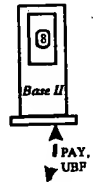
e. **Software**

- i. Any LAN that can communicate with Windows NT Server. e.g.: UNIX TCP/IP, IBM SNA®, Novell Netware®, Windows NetBEUI®, Appletalk®, DECnet®, etc.
- ii. Any operating system that can copy files to and from a given subdirectory on a Windows NT system.
- iii. Any software that the CSP currently uses to connect with the *Customer's PC*.

9. **Visa's Base II**

Visa's *Base II* system will be used to transport *ePay Payment Orders* between *ePay OWS* and *BBWS Workstations*, and to download *UBF Files* to the *ePay Switch*.

Note that, except for the downloading of *UBF Files*, connection to *Visa's Base II System* is outside the scope of the ESP Project.



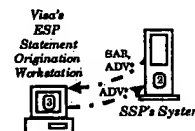
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F. Interfaces

1. ESP Statement Origination Workstation to the SSP's System

Administration Messages, Visa Format (ADV) and Statement Legacy Records, Augmented (SAR) are passed between the SSP's System and the ESP Statement Origination Workstation.

The SSP's System connects with the ESP Statement Origination Workstation via LAN.



The Windows NT software of the ESP Statement Origination Workstation can connect to most LANs in use today, including UNIX TCP/IP, IBM SNA, Novell Netware, Windows NetBEUI, Appletalk, DECnet, etc.

Two Network Shares provided by the ESP Statement Origination Workstation will be the main form of communication: *To_SSP* and *From_SSP*. Data is passed in ASCII files stored in these subdirectories, or in subdirectories below them.

A Network Share is a pointer to a subdirectory on a system - in this case, to a subdirectory on the ESP Statement Origination Workstation's Windows NT disk farm.

a. Transport Mechanism

Data is passed in ASCII files stored in two subdirectories (*To_SSP* and *From_SSP*), or in subdirectories below them. Once copied, files are deleted by the recipient.

i. Security

The SSP will need a Windows NT account with password on the ESP workstation. This account will be limited to read/execute/delete access for *To_SSP*, and write/execute access for *From_SSP*.

ii. Interface Control File

Each subdirectory has an *Interface Control File*.

This is a file recording each copy from and copy to performed by either party. It is archived by the ESP workstation.

Row Contents: "From"/"To", "SSP"/"ESP", Date-Time Stamp, Filename, Record Count, Hash Total (to be defined, by file type)

Filename: Control.txt

b. To_SSP

For either solution, this will contain the following data files, all in comma-delimited ASCII format.

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I. Interface Control File

II. ADV - Administrative Messages, Visa Format

See page 30 for a description.

Filename: ADV_999.txt, where 999 is a sequentially assigned number.

III. Customer Data

IV. SSP Customer Profile Table

See page 39.

Filename: Customer.txt

V. Template Data

VI. Template Index Table

See page 41. This file is used by the SSP to check the Statement Template Number portion of the Statement Descriptor (see page 42).

Filename: Template.txt

c. From_SSP

I. Interface Control Total File

II. ADV - Administrative Messages, Visa Format

See page 30 for a description.

Filename: ADV_999.txt, where 999 is a sequentially assigned number.

III. SAR - Statement Legacy Records, Augmented

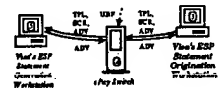
See page 41.

Filename: SAR\<CSP ID>.txt E.g.:

From_SSP\SAR\C1234567.txt

2. ESP Statement Origination Workstation to ePay Switch to ESP Statement Generation Workstation

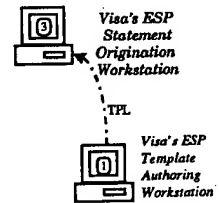
This communication path will be implemented as a RAS PPP connection - either dial-up, packet-switched, or dedicated. Messages will be transferred to and from a Microsoft Exchange Server running at the ePay Switch.



See *Incremental Template Updating* on page 19 for a complete description of the ESP System's use of Microsoft Exchange Server.

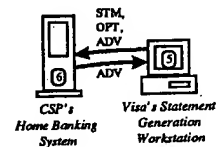
3. **ESP Template Authoring Workstation to the ESP Statement Origination Workstation**

This interface will consist entirely of new and updated *Templates*. It can be either a LAN link or "sneakernet" - the exchange of floppy diskettes.



4. **ESP Statement Generation Workstation to the CSP's Home Banking System**

Administration Messages, Visa Format (ADV), Fully Rendered Statement PDF Files (STM), Optional Detail PDF Files, and Optional Generic Enclosure PDF Files are passed between the ESP Statement Generation Workstation and the CSP's Home Banking System.



Communication between the CSP and ESP will be in the form of a Local Area Network. The Windows NT software of the ESP Statement Generation Workstation can connect to most LANs in use today, including UNIX TCP/IP, IBM SNA, Novell Netware, Windows NetBEUI, Appletalk, DECnet, etc.

a. **Transport Mechanism**

Data is passed in ASCII files stored in two subdirectories (*To_CSP* and *From_CSP*), or in subdirectories below them. Once copied, files are deleted by the recipient.

i. **Security**

The CSP will need a Windows NT account with password on the ESP workstation. This account will be limited to read/execute/delete access for *To_CSP*, and write/execute access for *From_CSP*.

ii. **Interface Control File**

Each subdirectory has an *Interface Control File*.

This is a file recording each copy from and copy to performed by either party. It is archived by the ESP workstation.

Row Contents: "From"/"To", "CSP"/"ESP", Date-Time Stamp, Filename, Record Count, Hash Total (to be defined, by file type)

Filename: Control.txt

b. **To_CSP**

This will contain the following data files, all in comma-delimited ASCII format.

i. **Interface Control Total File**

ii. **ADV - Administrative Messages, Visa Format**

See page 30 for a description.

In addition, the following files will be placed in a *Template* subdirectory, named for the *Template Number (Template ID without Version Number)*:

iii. **INF - Statement Index**

In comma-delimited ASCII format. See page 44 for a description.

iv. **The Statement Descriptor**

v. **This ASCII text contains all data necessary to pay the Statement and to display it on Non-Conforming Devices.**

See page 4240 for a definition of the *Statement Descriptor*.

vi. **The Fully Rendered Statement PDF File**

One of these per *Customer*: for a large CSP there will be thousands of these for each *Template*.

Since these are highly date specific, if *Statement Batches Solution* is used (see page 72), purging functions will have to be supplied by the CSP.

Filenames for these PDF Files are provided in the *Statement Index*.

See page 13 for a description.

vii. **Optional Details Index File**

In comma-delimited ASCII format.

viii. **Optional Details PDF Files**

ix. **Optional Enclosure Index File**

In comma-delimited ASCII format.

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x. Optional Enclosure PDF Files**c. From_CSP**

This will contain the following data files, all in comma-delimited ASCII format.

i. Interface Control Total File**ii. ADV - Administrative Messages, Visa Format**

See page 30 for a description.

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ESP Test Mode - Template Certification

When certifying a new *Statement Template*, a *SSP* will want to test the results before releasing it to production.

1. Step 1: Enter Test Data

Testing begins with entering test data into the data tables contained within the *Template*. This data is used to generate test *Statements* at the *ESP Template Authoring Workstation*.

2. Step 2: Place New *Template* Into Test Service

Once these meet the *SSP's* requirements, the *Template* is placed into *Test Service* by uploading it to the *ePay Switch* via the *Statement Template in Test Service Req ADV*.

3. Step 3: *SSP* Opens a Test *Customer* Account with *CSP*

The *SSP* opens a *Customer* account with a representative sample of *CSPs*.

When this *Test Customer* requests *ESP Service* for a *Statement*, the associated *Customer Statement Delivery Request ADV* is answered by a *Customer Statement Test Delivery Acknowledgment ADV*. This sets the *Test Account Flag* in both the *SSP* and *CSP Customer Profile Tables* (see page 39), and generates a "Dummy" *Statement Content Record* transmission to the *CSP*, from the test data entered into the *Template*. If data has been entered for more than one month, then *Statement Content Records* will be transmitted for each month available.

Statement Content Records arriving at the *ESP Statement Generation Workstation* triggers the generation of a *Fully Rendered Statement PDF File* using the test data.

Viewing these *Statements* via the *CSP's Home Banking Software*, in exactly the same way that the *Customer* will, will give the *SSP* complete confidence in their *Template* before placing it in production.

4. Safeguards

In order to safeguard against mishaps, *Templates* placed into *Test Service* (ref: *Template Data*

Template Index Table on page 41) cannot generate *Statements* for *non-test Customers* (ref: *CSP Customer Profile Table* on page 40), nor can they be used to parse *Statement Legacy Records* from the *SSP* (ref: *SSP Customer Profile Table* on page 39).

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Future Considerations

None of the following items will prevent the Pilot from going forward. Some of them will need to be addressed before General Release.

1. Downloading unchanging *Statement* elements to the *Customer's PC* is inefficient

Caching *Statement* elements on the *Customer's PC* is tricky because

- many different configurations of PC's are possible
- it is the property of the *Customer*, and requiring that files be stored there may be a political issue

In addition, new Adobe technology has greatly improved downloading of PDF Files, as follows:

- all text and graphics are stored within the PDF File in Zipped format
- repeating bitmaps are detected and included only once
- WWW bit-serving technology is used to display the PDF file as it is downloaded - the *Customer* does not have to wait until the whole file is downloaded before viewing it.

2. Manipulation of Adobe Interactive Elements from within the Template

Currently, manipulation of Adobe Interactive Elements within the *The Interactive Page* (see page 12) is restricted to FDF files generated by the *FDF Writing Module* (see page 16) within the *Template*.

Direct manipulation of Adobe Interactive Elements on the Access Report would be a major benefit. This would allow, for example, a Web link to be placed over telephone numbers on a telephone bill, so that the *Customer* could find out who they had called.

3. Too Many Fonts

The performance of Windows workstations degrade when too many fonts are installed (over 500).

Font management software may be needed for post-pilot implementation.

4. Generation of *Fully Rendered Statement PDF Files* for *Non-conforming Device Customers*

Generation of *Fully Rendered Statement PDF Files* for *Non-conforming Device Customers* is a waste of processing, since *Non-conforming Devices* cannot display *Fully Rendered Statement PDF Files*.

Avoiding this is deferred to post-pilot implementation.

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5. System Certification: Installation at New Sites, and System Upgrades

Once the *ESP System* enters production, newly added *SSP* or *CSP* sites will have to be tested before they can join the system with any degree of safety. In addition, modifications to the *ESP* software, and installation of new versions of system software or hardware will have to be tested before they can join the system.

This can be performed by a complete "test" system: a *second ePay Switch*, communications system and workstations. The *Statement Origination Workstations* will be designed to have a representative "test" *Statement Content Record Stream* to send upon command to a number of *Statement Generation Workstations*.

This system needs to have only a small fraction of the capacity of the production system, yet its value in certifying new sites, software and hardware will be invaluable, especially in a high-reliability environment like *ESP*.

6. Determine OLE Servers to be made available to Statement Originators

OLE objects, such as graphs, drawings, etc., can be imbedded into *Template* reports. Use of such objects requires that the associated OLE Server (a program such as Microsoft Excel, CorelDRAW, etc.) be installed, in the correct version, at ALL *ESP Statement Generation Workstations*.

This is a licensing and management issue, not a technical one.

7. Statement Service Providers with Multiple Sites

Statement Service Providers with Multiple Sites will simply have a different *SSP ID* for each site. If a *Statement Originator* is delivering *Statement Legacy Records* to more than one site, they will require separate *UBF Biller ID's* for each site.

Since a *Template* can be for only *UBF Biller ID*, this means that the appropriate *Templates* will have to be duplicated.

It would be much more elegant if this was handled by the system.

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Appendix A - What's New ?

The purpose of this section is to highlight differences between the architecture described in Versions 1.1 and 1.2 of this document.

1. Name Changes

Old Name	New Name
Invoice	Statement (may not require payment !!)
Biller	Statement Originator
ESP BSP Workstation	ESP Statement Origination Workstation
Biller Service Provider	Statement Service Provider
BSP	SSP
Customer Service Provider (CSP)	Customer Financial Institution or its Service Provider (CSP)
Consumer	Customer (may be a business)
BSP Biller ID	SSP Biller ID
Biller Account Number	CBAN
Interactive Area	Interactive Page
Statement Index Record	Statement Descriptor
Billing Date	Statement Cycle Date

2. New Statement Structure

The ESP System's market success will depend on satisfying both *Customers* and *Statement Originators*. *Customers* want to download only information of interest to them, and *Originators* do not want to annoy *Customers* with unwanted information. Accordingly, to encourage optional data and brevity in mandatory data, we have formalized the constituents of any statement, as shown below.

a. Statement Constituents

i. Interactive Page

E.g. buttons to request optional documents, to access multi-media features, and to access Web-links

ii. Mandatory Customer-Specific Pages

E.g. bill summary

iii. Mandatory Generic Enclosures

E.g. regulatory enclosures

iv. Optional Customer-Specific Pages

E.g. bill detail

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v. **Optional Generic Enclosures**

E.g. promotions

vi. **Statement Descriptor Data**

E.g. summary data and pointers to PDF files.

Statement Descriptor Data is the only one required. Note that current design provides explicitly for *Optional Customer-Specific Pages*, which, if present, will require generation of a second Access report. This second Access-generated PDF file would be created during the same OLE call to Access as the first.

b. **Statement PDFs**

A *Statement* is presented to the *Customer* in the following parts:

I. **Fully Rendered Statement PDF File**

This file contains the *Interactive Page* (if present) and any mandatory portions of the statement.

II. **Optional Customer-Specific PDF File**

At most one of these exists per *Statement*. E.g. *Statement Detail*.

III. **Optional Generic Enclosure PDF Files**

Any number of these exist for a *Statement*. E.g. promotions.

3. **CSP Portion of Interactive Page Deleted**

Version 1.1 stated that each CSP would be responsible for authoring an *Interactive Page* of fixed size to be merged with the SSP's portion of the *Interactive Page*. The CSP's portion had been required to have a "Pay" button and a "List of Statements" button, and would likely have featured the CSP's logo as well. The CSP would have used Acrobat Exchange to create this portion of the page, and would have used a custom ESP plug-in (nicknamed the "Inverse Distiller") to save it in PostScript/PDFMark format. CSPs would have been required to register this PostScript fragment with the *ePay Switch*. Visa personnel would have verified its dimensions and functionality before marking it suitable for commercial use.

For the current design, this requirement has been deleted because we feel that the CSP's interactive functionality (*Pay* and *List of Statement* buttons) is better accomplished using the native format of the server. For Web- or Intranet-based servers, this format is HTML, whereas for proprietary software, this format is the language (e.g. C++) used to develop the software. In deleting this requirement, we put more control back into the hands of the CSP and also enable other simplifying changes to the generation process.

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4. New Statement Authoring and Generation Procedures

a. The Old Way

The procedure for generating the *Fully Rendered Statement PDF* has been changed significantly. In Version 1.1, the *Fully Rendered Statement PDF* was generated by first creating *CSP* and *SSP* portions of the *Interactive Page* and saving them in PostScript/PDFMark format, using a custom plug-in to be installed with Acrobat Exchange at the *ESP Template Authoring Workstation*.

These PostScript fragments were to be combined (by Adobe Distiller, which converts PostScript to PDF) with the Access-generated personalized statement that had previously been written to file in PostScript format. The *Interactive Page* was to have been created in PDF format using Acrobat Exchange, converted to PostScript using the *Inverse Distiller Custom Plug-In*, and then merged with the Access output and converted back to PDF using Distiller. This circuitous procedure was needed to tightly stitch the *Interactive Page* to the Access page and to merge the *CSP* portion of the *Interactive Page* with the *SSP*'s portion.

b. The New Way

By dropping the need to stitch the *Interactive Page* to the first page of the Access report, and by dropping the need for a *CSP* portion of the interactive page, we have simplified authoring and generation considerably.

In the current design, the *Interactive Page* is created entirely by the *Statement Originator* as a forms-based Acrobat 3.0 document, and is saved as a *Template* resource.

During *Statement Generation*, a FDF File may be created which is later used by Adobe Exchange to customize the *Interactive Page*.

The Access report is written out directly in PDF format using Adobe's PDFWriter device driver rather than being written first to PostScript and then later converted to PDF format by Adobe Distiller.

Finally, the merge of the *Interactive Page PDF*, the *Mandatory Customer-Specific PDF* pages, and any *Mandatory Generic Enclosure PDFs* is accomplished using Acrobat Exchange, called as an OLE server to the main Visual Basic software.

The current design avoids the need to develop and maintain (in C) the *Inverse Distiller* custom Acrobat plug-in, the need to write custom code to accomplish the PostScript merge, the need to use Distiller, and the need to register and validate the *CSP Interactive Area*.

5. Incremental Template Updating

To minimize data flow, *Templates* will be updated rather than replaced - that is, only items that change will be transported through the system.

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However, this capability may be deferred until after the Pilot.

See *Incremental Template Updating* on page 19.

6. **Statement Content Record Transportation**

In both Version 1.1 and 1.2, *Statement Content Records* are to be transported as attachments to Microsoft Exchange (not to be confused with Adobe Exchange !) mail messages.

Version 1.1 was based on sending in each mail message a single attachment containing a comma-delimited representation of just those records (from one or more tables) needed to generate a single *Statement*. This approach has the advantage that a corrupted transmission affects only one *Statement*. In the current design, each mail message will contain all the data needed to create a batch of *Statement* (e.g.: 500 or 5,000) in the form of separate attachments, one for each required table.

- By keeping data from different tables in separate attachments, we avoid the processing time required for assembly and for disassembly.
- By grouping a batch of statements together in one mail message, we improve the efficiency of SQL Server table updating.
- To the extent that batches are kept small, we can minimize the impact of corrupted transmissions.

The current design provides the ability to optimize the batch size by trading off the adverse impact of data corruption against the adverse impact of excessive processing to bundle and unbundle data.

7. **Distribution of Standard Statement Rendering Tool**

In response to expressions of interest from SSPs, the *The Standard Statement Rendering Tool* (see page 49) will be made available to both CSPs and SSPs themselves, not just to Visa's workstations on their premises. SSPs and CSPs may wish to provide this tool to their Customer Service Departments.

8. **Switch Design**

To augment security and level telecommunications loading at the *ePay Switch*, we now plan to poll (call out to) all Workstations from the *ePay Switch*.

In the event that CSPs or SSPs are unwilling to transfer data via incoming calls, we may institute call-back procedures wherein CSPs and SSPs call the *ePay Switch* whenever they receive any incoming call.

Normally, the calls coming to CSPs and SSPs would be from the *ePay Switch* advising its desire to communicate. Authentication codes could be devised for the originating and the call-back calls that would discourage hacking.

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9. Administrative Messages

a. Generation Failure

We have added an urgent message in the event of *Statement* generation failure.

b. *Statement Originator* Splits and Mergers

Statement Originator initiated account number changes, for whatever reason, will require a new Administrative Message from *SSPs* to *CSPs*.

CSPs or our *Statement Generation Workstation* will need to keep both an effective date and an expiration date associated with each UBF number / account number pair to be able to supply historical statements.

Dates are also needed for integrity in the event that *Statement Originators* re-assign account numbers to different customers using the same *CSP*, e.g. reassign telephone numbers.

10. Mail Robots.

In Version 1.1, an asymmetry in the mail delivery process arose because the *CSP* could only address *Statement Originators* and not their *SSPs* (to whom their mail must first be delivered).

This was because the system had been designed such that *CSPs* do not know *Statement Originator's SSPs*. The consequence was that we needed a mail robot at the *ePay Switch* to log on as each *Statement Originator* and move that *Statement Originator's* incoming mail to the outbox of its *SSP*.

For the current design, we are proposing to allow *CSPs* access to selected fields of the UBF which will allow them to address mail directly to a *Statement Originator's SSPs*. This eliminates the need for one mail robot process at the *ePay Switch*.

11. Universal Biller File (UBF)

Two new fields have been added to the UBF, one 16-byte field for an ID, and one 24-byte field intended for ESP flags.

See UBF - Universal Biller File on page 28 for a complete description.

12. CSP Account Number

CSPs will now be able to pass an identification field with each *Customer Statement Delivery Request* ADV that can be used to identify its *Customers*.

This key will enable the *Statement Generation Workstation* to respond to queries for all *Statements* available for a given *CSP Account Number*.

Note that use of this identification number is optional, and that the number if given need not correspond to the actual customer number used by the *CSP* to identify its *Customer*.

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See *CSP Customer Profile Table* on page 40.

13. **Statement Download Log & CSP Pull Procedures**

A *SSP* may now request notification when one of their *Statements* is Pulled by the *CSP* and when it is Pushed to the Customer.

See *Statement Download Log* on page 44.

14. **Summary Types**

Statements will be of a designated type, and *Statement Descriptor* (see page 42) will vary accordingly.

Types will include at the outset: invoices, statements, and advisories. Invoices are bills and are characterized by being payable.

15. **ESP Customer Activation**

The option of having the *Statement Origination Workstation* respond positively or negatively to activation requests on behalf of the *Statement Originator* has been dropped for lack of interest. Instead, the *Workstation* will pass activation requests directly to the *Statement Service Providers* system who will respond on the *Statement Originator's* behalf or pass it directly to the *Statement Originator*.

16. **Payment Issues**

The capability to split payments among multiple accounts with the same payee will be deferred until after pilot.

17. **Multi-Site SSP Operations**

SSPs who must generate statements for the same *Statement Originator* from multiple sites, each with its own *SSP ID*, will have to handle passing *Templates* and mail messages among these sites internally. We will continue view each *Statement Originator* as having a unique *SSP* endpoint.

18. **Security**

Although we may defer use of Exchange-based encryption and digital signatures on top of NT security during pilot to speed development, we continue to intend to implement this capability for commercial operations.

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Appendix B- What it takes to be an *ESP Statement Service Provider*

To set up operations as an *ESP Statement Service Provider* for the *ESP Pilot* will require the following:

- Hosting of *ESP* hardware
- Communication with the *ESP* hardware
- Communication with *Visa's ePay Switch*
- Modification to your current data processing system
- Development of *Statement Templates*, in the form of Microsoft Access Reports

A. Hosting of *ESP* Hardware

Visa's ESP Statement Origination Workstation will be installed at your site. For purposes of the *ESP Pilot*, this will be a single Intel-based box running Windows NT Workstation. For production volumes, this may be upgraded to Windows NT Server, and several more Intel and non-Intel (e.g.: DEC Alpha) CPU's may be added.

During the *ESP Pilot*, this equipment will be developed, installed, and maintained by *Visa*. It will be operated by the *SSP*, and its reports will be monitored by the *SSP*.

B. Communication with the *ESP* Hardware

The *SSP's System* connects with the *ESP Statement Origination Workstation* via LAN.

The Windows NT software of the *ESP Statement Origination Workstation* can connect to most LANs in use today, including UNIX TCP/IP, IBM SNA, Novell Netware, Windows NetBEUI, Appletalk, DECnet, etc.

Communication is via copying ASCII files over the LAN to and from Network Shares provided by the *ESP Statement Origination Workstation*.

C. Communication with *Visa's ePay Switch*

Communication from the *ESP Statement Origination Workstation* to *Visa's ePay Switch* will be required. The bandwidth necessary will depend completely upon the volume of *Statements* involved in the Pilot.

This will be supplied by the *SSP* to *Visa's* specifications. For purposes of the Pilot, a pair of telephone lines or a single ISDN line will be ample.

D. Modification to your Current Data Processing System

For a complete description of the *SSP's* system's requirements, please see page 49.

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The main print stream will be split into two streams: one for print and one for *ESP*, depending upon the *Customer Profile Table*. Some *Customer's* data will go to one or the other and some will go to both.

The *ESP* stream will be modified into the format of *Statement Legacy Records, Augmented* (see page 41).

The *SSP* will have to receive and process *Administrative Messages* (ADV - see page 28) and generate responses and return them to the *ESP Statement Origination Workstation*. See page 49 for a complete description of this process.

E. Development of *Statement Templates*, in the form of Microsoft Access Reports

1. *Statement Templates*

TPL - The *Statement Templates* are described on page 15.

One of these will be required for each different *Statement* type that will be processed by *ESP*. In addition, each month that a change is made to a *Statement*, the *Template* must be updated.

2. The level of Access expertise needed

The level of Access expertise needed to generate a *Template* depends upon the level of sophistication of the *Statement*.

Desktop-publishing staff should be proficient at developing simple *Templates* with a few hour's training. Complex *Templates* will require the efforts of both the desktop-publishing staff and an Access consultant.

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Appendix C- What it takes to be an *ESP Customer Financial Institution/Service Provider*

To set up operations as an *ESP Customer Financial Institution/Service Provider* for the *ESP Pilot* will require the following:

- Hosting of *ESP* hardware
- Communication with the *ESP* hardware
- Communication with *Visa's ePay Switch*
- Modification to your current data processing system

A. Hosting of *ESP* Hardware

Visa's ESP Statement Generation Workstation will be installed at your site. It is an Intel-based Windows NT system with a LAN connection to your *Home Banking System*, and a communication link to *Visa's ePay Switch*.

For purposes of the *ESP Pilot*, this will be a single Intel-based box running Windows NT Workstation. For production volumes, this may be upgraded to Windows NT Server, and several more Intel and non-Intel (e.g.: DEC Alpha) CPUs may be added.

During the *ESP Pilot*, this equipment will be developed, installed, and maintained by *Visa*. It will be operated by the *CSP*, and its reports will be monitored by the *CSP*.

B. Communication with the *ESP* Hardware

A LAN connection with the *ESP Statement Generation Workstation* will be required. The Windows NT software of the *ESP Statement Generation Workstation* can connect to most LANs in use today, including UNIX TCP/IP, IBM SNA, Novell Netware, Windows NetBEUI, Appletalk, DECnet, etc.

C. Communication with *Visa's ePay Switch*

Communication from the *ESP Statement Generation Workstation* to *Visa's ePay Switch* will be required. The bandwidth necessary will depend completely upon the volume of *Statements* involved in the *Pilot*.

This will be supplied by the *SSP* to *Visa's* specifications. For purposes of the *Pilot*, a pair of telephone lines or a single ISDN line will be ample.

D. Modification to your Current DP System

Three major new functions must be added: *ESP Sign-up*, *Statement* and *Optional Enclosure* display, and *Statement Payment*.

For a description of the data that must be stored and the processes that must be supported, see page 71.

Appendix D- A Sample *Statement* using Microsoft Access® Reports

A. Introduction

An sample *Statement* was generated using Microsoft Access® v7.0. The following elements are included:

1. A photocopy of the original *Statement*
2. Adobe Acrobat (PDF) version of the *Statement*.
3. *Statement Augmented Records (SAR)*
4. The *Statement Template*, including *Statement Stationary*, parsing tables, and reports
5. *Statement Content Records and Tables*
6. Files, with their sizes in compressed and uncompressed form, as generated by this example

B. A Photocopy of the Original *Statement*.

Figure 11 - A Photocopy of the Original *Statement*

C. Adobe Acrobat (PDF) version of the *Statement*.

Two *Statements* are generated, one for a *Customer* with *Paid* = True, and one, with *Paid* = False.

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Figure 12 - A Statement with Paid = False

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Figure 13 - A Statement with Paid = True

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D. Statement Augmented Records (SAR)

These SAR Records are in *Fixed-Length* format. They could also be in *SQL-Table*, *Print-Image*, or *Comma-Delimited* form.

Note that Record type "0000" is the *Statement Content Header*. *UBF Biller ID (BIN)* = 123456789012, and *Template ID Number* = T0000001. **Bolding** is used to show separate fields.

.....1.....2.....3.....4.....5.....6.....7.....
.8

USPT050028095.100996

```

000000000000 123456789012T0000001

10040000000010122222306/06/96
100400010000Suzie Q Public
100400020000123 Somewhere Ave, #999
100400030000This is the Place
100400040000San Elsewhere, CA      99999
10040005000006/21/960000432.10800 678-8796444 555-1212
100400060000San Elsewhere Showroom
100400070000False

11130001000106/01/9601000000.00
111300010002Rental- 9 items, 06/01/96 to 07/01/96
111300020000106/01/9602100004.90
111300020002BED FRAME- KING, QUEEN
111300030000106/01/96031000017.20
111300030002BLUE DAMASK QUEEN MATTRESS
111300040000106/01/96041000013.40
111300040002BLUE DAMASK QUEEN BOXSPRING
111300050000106/01/9605200007.02
111300050002PROLIC CHAIR
111300060000106/01/9606200009.60
111300060002TARRAGANO NITE STAND
111300070000106/01/96071000013.50
111300070002BERLIN IVORY DINING TABLE
111300080000106/01/9608100005.95
111300080002LAMP- ALMOND
111300090000106/01/96090000095.25
111300090002Damage Protection00007.0600095.25
111300100000106/01/96010
111300100002Distribution fee00000.0000040.00

100400000000239355758206/06/96
100400010000John J Jones
100400020000324 This St, #567
100400030000Over There, CA      94402
100400040000
10040005000006/21/960000135.25800 678-8796444 555-1212
100400060000Foster City Showroom
100400070000True

11130001000106/01/9601000000.00
111300010002Rental- 9 items, 06/01/96 to 07/01/96
111300020000106/01/9602100004.90
111300020002BED FRAME- KING, QUEEN
111300030000106/01/96031000017.20
111300030002BLUE DAMASK QUEEN MATTRESS
111300040000106/01/96041000013.40
111300040002BLUE DAMASK QUEEN BOXSPRING
111300050000106/01/9605200007.02

```

```

111300050002FROLIC CHAIR
11130006000106/01/9606200009.60
111300060002TARRAGANO NITE STAND
11130007000106/01/96071000013.50
111300070002BERLIN IVORY DINING TABLE
11130008000106/01/9608100005.95
111300080002LAMP- ALMOND
11130009000106/01/96090000095.25
111300090002Damage Protection00007.0600095.25
11130010000106/01/96010
111300100002Distribution fee00000.0000040.00

```

Figure 14 - Statement Augmented Records (SAR)

E. The Statement Template

The *Statement Template* consists of the following parts:

- The Access Tables
- The Access Reports
- Statement "Stationary" Bitmap
- SAR/Transport Mapping

It also contains the *Standard Class Module*, as described in *Appendix E - The Statement Template Access Class Module* on page 103.

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1. The Access Tables

a. SAR Fixed Length Parsing Table

Slightly different formats would be used for other SAR Types.

Field #	Table	Field Name	Field Type	Key Record LIKE	Field Offset	Field Length
1		UBF Biller ID	text	000000000000 0	13	12
2		Template_ID	text	000000000000 0	25	7
3		CBAN	text	100400000000 0	13	10
4		Statement_Cycle_Date	date	100400000000 0	23	8
5		Customer_Name	text	10040001000 0	13	0
6		Customer_Address_1	text	10040002000 0	13	0
7		Customer_Address_2	text	10040003000 0	13	0
8		Customer_Address_3	text	10040004000 0	13	0
9		Due_Date	date	10040005000 0	13	8
10		Amount_Due	currency	10040005000 0	21	10
11		Questions_Phone	text	10040005000 0	31	13
12		Other_Phone	text	10040005000 0	44	13
13		Location	text	10040006000 0	13	0
14		Paid	Boolean	10040007000 0	13	5
15	Items	Item_Date	date	1113????000 1	13	8
16	Items	Order	integer	1113????000 1	21	2
17	Items	Quantity	integer	1113????000 1	23	1
18	Items	Monthly_Rate	currency	1113????000 1	24	8
19	Items	Cost	currency	1113????000 1	32	8
20	Items	Description	text	1113????000 2	13	0

Figure 15 - SAR Fixed Length Parsing Table

b. Statement Resource Table

Statement Resource Type	Statement Resource Name	File Name	Statement Resource
Font	Century Schoolbook	Schblk.ttf	font file
Bitmap	Statement Stationary	T0000001.bmp	bitmap of Statement Stationary

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Figure 16 - Statement Resource Table

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BROOK™
FURNITURE RENTAL, INC.
HOME & OFFICE
P.O. BOX 100515 PASADENA, CA 91189-0515

[H]

FOR CHANGE OF ADDRESS INDICATE HERE ☐ AND SEE REVERSE SIDE.
PLEASE DETACH AND MAIL WITH YOUR PAYMENT, IF PAYING IN PERSON, BRING STATEMENT.

ACCOUNT NUMBER
BILLING QUESTIONS? CALL:
FOR OTHER QUESTIONS, CALL:
SEE BACK FOR IMPORTANT

DUE DATE

AMOUNT DUE

PAYMENTS IN
PERSON
PAID

DUE DATE

DATE	DESCRIPTION	AMOUNT
<p style="font-size: 2em; margin: 0;">BROOK™</p> <p style="font-size: 1.5em; margin: 0;">FURNITURE RENTAL</p> <p style="font-size: 1.2em; margin: 0;">HOME & OFFICE</p>		
STATEMENT DATE <input type="text"/>		CURRENT BALANCE <input type="text"/>

Figure 17 - Statement "Stationary" Bitmap

c. T0000001

Field	Value - Record 1	Value - Record 2
Account Number	1012222223	2393557582
Statement Cycle Date	06/06/96	06/06/96
Customer Name	Suzie Q Public	John J Jones
Customer Address 1	123 Somewhere Ave, #999	324 This St, #567
Customer Address 2	This is the Place	Over There, CA 94402
Customer Address 3	San Elsewhere, CA 99999	
Due Date	06/21/96	06/01/96
Amount Due	\$432.10	\$135.25
Questions Phone	800 678-8796	800 678-8796
Other Phone	444 555-1212	415 573-5120
Location	San Elsewhere Showroom	Foster City Showroom
Paid	False	True

Figure 18 - Primary Data Records

d. T0000001_Items

Account Number	Statement Date	Item Date	O	Q	Description	Rate	Cost
1012222223	06/06/96	06/01/96	1	0	Rental- 9 items, 06/01/96 to 07/01/96	\$0.00	\$0.00
1012222223	06/06/96	06/01/96	2	1	BED FRAME- KING, QUEEN	\$4.90	
1012222223	06/06/96	06/01/96	3	1	BLUE DAMASK QUEEN MATTRESS	\$17.20	
1012222223	06/06/96	06/01/96	4	1	BLUE DAMASK QUEEN BOXSPRING	\$13.40	
1012222223	06/06/96	06/01/96	5	2	FROLIC CHAIR	\$7.02	
1012222223	06/06/96	06/01/96	6	2	TARRAGANO NITE STAND	\$9.60	
1012222223	06/06/96	06/01/96	7	1	BERLIN IVORY DINING TABLE	\$13.50	
1012222223	06/06/96	06/01/96	8	1	LAMP- ALMOND	\$5.95	
1012222223	06/06/96	06/01/96	9	0	Damage Protection	\$7.06	\$95.25
1012222223	06/06/96	06/01/96	10	0	Distribution fee	\$0.00	\$40.00
2393557582	06/06/96	06/01/96	1	0	Rental- 9 items, 06/01/96 to 07/01/96	\$0.00	\$0.00
2393557582	06/06/96	06/01/96	2	1	BED FRAME- KING, QUEEN	\$4.90	
2393557582	06/06/96	06/01/96	3	1	BLUE DAMASK QUEEN MATTRESS	\$17.20	
2393557582	06/06/96	06/01/96	4	1	BLUE DAMASK QUEEN BOXSPRING	\$13.40	
2393557582	06/06/96	06/01/96	5	2	FROLIC CHAIR	\$7.02	
2393557582	06/06/96	06/01/96	6	2	TARRAGANO NITE STAND	\$9.60	
2393557582	06/06/96	06/01/96	7	1	BERLIN IVORY DINING TABLE	\$13.50	
2393557582	06/06/96	06/01/96	8	1	LAMP- ALMOND	\$5.95	
2393557582	06/06/96	06/01/96	9	0	Damage Protection	\$7.06	\$95.25
2393557582	06/06/96	06/01/96	10	0	Distribution fee	\$0.00	\$40.00

Figure 19 - "Item" Data Records

2. The Access Reports

Two Access Reports are use: T0000001, and T0000001_Items. The second is included as a SubReport of the first, linked by *Account Number* and *Statement Cycle Date*.

The *Statement Stationary Bitmap* is included as a Picture of the Report - i.e.: as a "Watermark". Converting this to a data-only report with the Stationary in a second PDF

file simply consists of deleting the Picture. This can be done from logic within the Report, triggered by, say, a global value in the Registry, set during system installation.

The "Paid in Full" notice is an OLE Link to a Microsoft WordArt v2.0 object, called Paid_in_Full. The *On Format* event for the detail lines says:

Me.Paid_in_Full.Visible = (Me.Paid)

Figure 20 - Code to control Paid_in_Full

In other words, we only see the WordArt object if Paid = True.

F. Statement Content Records

1. The Records

Statement Content Records are transmitted in comma-delimited form. Records for all *Statements* for a single *CSP* and *Statement Template* are batched together into a single mail message. The message is addressed as to the *CSP ID*, from the *SSP ID*.

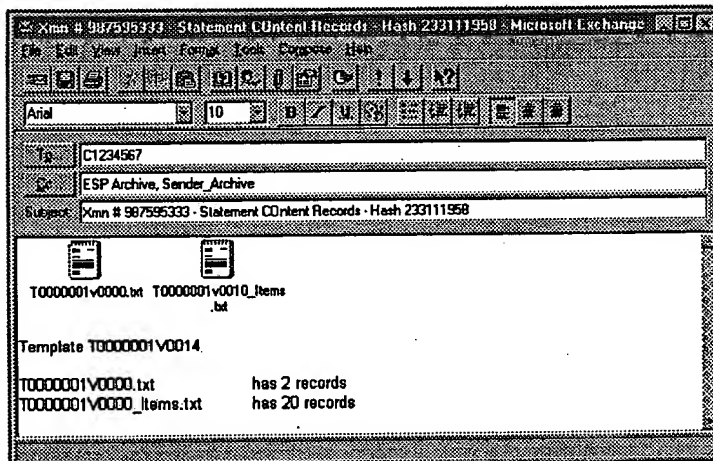


Figure 21 - The SAR E-Mail

2. Records for this Statement

"1012222223",6/6/96 0:00:00,"Suzie Q Public","123 Somewhere Ave, #999","This is the Place","San Elsewhere, CA 99999",6/21/96 0:00:00,\$432.10,"800 678-8796","444 555-1212","San Elsewhere Showroom", \$0.00,0

"2393557582",6/6/96 0:00:00,"John J Jones","324 This St, #567","Over There, CA 94402",6/1/96 0:00:00,\$135.25,"800 678-8796","415 573-5120","Foster City Showroom", \$0.00,1

Figure 22 - T0000001V0000.txt

"1012222223",6/6/96 0:00:00,6/1/96 0:00:00,1,0,"Rental- 9 items, 06/01/96 to

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"07/01/96", \$0.00, \$0.00
"1012222223", 6/6/96 0:00:00, 6/1/96 0:00:00, 2, 1, "BED FRAME- KING, QUEEN", \$4.90,
"1012222223", 6/6/96 0:00:00, 6/1/96 0:00:00, 3, 1, "BLUE DAMASK QUEEN MATTRESS", \$17.20,
"1012222223", 6/6/96 0:00:00, 6/1/96 0:00:00, 4, 1, "BLUE DAMASK QUEEN BOXSPRING", \$13.40,
"1012222223", 6/6/96 0:00:00, 6/1/96 0:00:00, 5, 2, "FROLIC CHAIR", \$7.02,
"1012222223", 6/6/96 0:00:00, 6/1/96 0:00:00, 6, 2, "TARRAGANO NITE STAND", \$9.60,
"1012222223", 6/6/96 0:00:00, 6/1/96 0:00:00, 7, 1, "BERLIN IVORY DINING TABLE", \$13.50,
"1012222223", 6/6/96 0:00:00, 6/1/96 0:00:00, 8, 1, "LAMP- ALMOND", \$5.95,
"1012222223", 6/6/96 0:00:00, 6/1/96 0:00:00, 9, 0, "Damage Protection", \$7.06, \$95.25
"1012222223", 6/6/96 0:00:00, 6/1/96 0:00:00, 10, 0, "Distribution fee", \$0.00, \$40.00
"2393557582", 6/6/96 0:00:00, 6/1/96 0:00:00, 1, 0, "Rental- 9 items, 06/01/96 to 07/01/96", \$0.00, \$0.00
"2393557582", 6/6/96 0:00:00, 6/1/96 0:00:00, 2, 1, "BED FRAME- KING, QUEEN", \$4.90,
"2393557582", 6/6/96 0:00:00, 6/1/96 0:00:00, 3, 1, "BLUE DAMASK QUEEN MATTRESS", \$17.20,
"2393557582", 6/6/96 0:00:00, 6/1/96 0:00:00, 4, 1, "BLUE DAMASK QUEEN BOXSPRING", \$13.40,
"2393557582", 6/6/96 0:00:00, 6/1/96 0:00:00, 5, 2, "FROLIC CHAIR", \$7.02,
"2393557582", 6/6/96 0:00:00, 6/1/96 0:00:00, 6, 2, "TARRAGANO NITE STAND", \$9.60,
"2393557582", 6/6/96 0:00:00, 6/1/96 0:00:00, 7, 1, "BERLIN IVORY DINING TABLE", \$13.50,
"2393557582", 6/6/96 0:00:00, 6/1/96 0:00:00, 8, 1, "LAMP- ALMOND", \$5.95,
"2393557582", 6/6/96 0:00:00, 6/1/96 0:00:00, 9, 0, "Damage Protection", \$7.06, \$95.25
"2393557582", 6/6/96 0:00:00, 6/1/96 0:00:00, 10, 0, "Distribution fee", \$0.00, \$40.00

Figure 23 - T0000001V0000_Items.txt

G. File Sizes.

File	Size (bytes)	Description
T0000001.bmp	671 k	- "Stationary" bitmap (not used)
T0000001.cdr	35 k	- "Stationary" bitmap - CorelDRAW!
T0000001.mdb	254 k	- Access Database with reports & bitmap
mdb.zip	85 k	- contains T0000001.MDB
T0000001.pdf	53 k	- "Complete" PDF
PDF.zip	53 k	- contains T0000001.pdf - already compressed

Figure 24 - File Sizes for the "Brook" Statement

Appendix E - The Statement Template Access Class Module

A Microsoft Access "Class Module" allows Access to act as an OLE Automation Server. It is a Visual Basic for Access module which allows definition of Properties and Methods for OLE Automation Clients to set and call.

To allow a *Statement Template* to be processed by *The ESP Statement Generation Workstation*, the following must be defined within the public Class Module:

Properties	CBAN	Used to select records from <i>Statement Content Tables</i> .
	Statement_Cycle_Date	ditto
	Show_Stationary	True or False. Hides or shows <i>Statement "Stationary"</i> , in the form of a "Picture" on the main Report or SubReport.
	Data_Source	"Test" or "Prod"
	Connect_String	If Data_Source = "Prod" then use Connect_String to attach to ODBC Database.
Methods	Generate Report	1/ Set output to file <CBAN>.PDF (e.g.: "(415)372-1492.PDF". Note that this assumes that the CBAN does not contain any characters that Microsoft Windows NT v4.0 considers illegal in filenames. This is subject to conformation). 2/ Set the Report Filters to select only this CBAN. 3/ Generate the Report.

Figure 25 - Properties and Methods Common to ALL *Statement Templates*

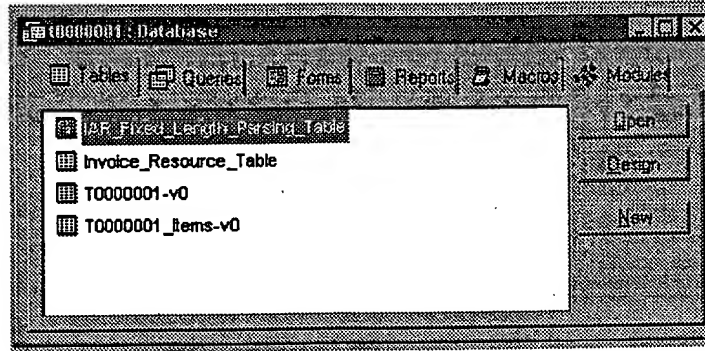
Other Properties and Methods will be added as needed.

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Appendix F - Anatomy of the Access Examples

Two example *Statements* are presented: the Brook Statement of Appendix D and a Pacific Bell *Statement*.

A. The Brook Invoice Template



1. The Tables

a. IAR_Fixed_Length_Parsing_Table

Effective Date	Table Name	Field Name	Field Type	Key LIKE	Field Offset	Field Len
06/06/96		UBF Biller ID	text	000000000000	13	12
06/06/96		Template_ID	text	000000000000	25	7
06/06/96		Biller Account Number	text	100400000000	13	10
06/06/96		Invoice Date	date	100400000000	23	8
06/06/96		Customer Name	text	100400010000	13	0
06/06/96		Customer Address 1	text	100400020000	13	0
06/06/96		Customer Address 2	text	100400030000	13	0
06/06/96		Customer Address 3	text	100400040000	13	0
06/06/96		Due Date	date	100400050000	13	8
06/06/96		Amount Due	currency	100400050000	21	10
06/06/96		Questions Phone	text	100400050000	31	13
06/06/96		Other Phone	text	100400050000	44	13
06/06/96		Location	text	100400060000	13	0
06/06/96		Paid	boolean	100400070000	13	5
06/06/96	Item	Item Date	date	1113????0001	13	8
06/06/96	Item	Order	integer	1113????0001	21	2
06/06/96	Item	Quantity	integer	1113????0001	23	1
06/06/96	Item	Monthly Rate	currency	1113????0001	24	8
06/06/96	Item	Cost	currency	1113????0001	32	8
06/06/96	Item	Description	text	1113????0002	13	0

b. Invoice_Resource_Table

Effective Date	Invoice Resource Type	Invoice Resource Name	FileName	Invoice Resource
06/06/96	Font	Century Schoolbook	Schlbk.zip	Binary Object
06/06/96	Bitmap	Invoice Stationary	cdr.zip	Binary Object

c. T0000001-v1

Acct #	Invoice Date	Customer Name	Customer Address 1	Customer Address 2	Customer Address 3	Due Date	Amount Due	Questions Phone	Other Phone	Location	Prev Bal	Paid
101222223	06/06/96	Suzie Q Public	123 Somewhere Ave, #999	This is the Place	San Elsewhere, CA 99999	06/21/96	\$432.10	800-678-8796	444-555-1212	San Elsewhere Showroom	\$0.00	0
2393557582	06/06/96	John J Jones	324 This St, #567	Over There, CA 94402		06/01/96	\$135.25	800-678-8796	415-573-5120	Foster City Showroom	\$0.00	-1

d. T0000001_Items-v1

Account Number	Invoice Date	Item Date	Order	Qty	Description	Monthly Rate	Cost
101222223	06/06/96	06/01/96	1	0	Rental- 9 items, 06/01/96 to 07/01/96	\$0.00	\$0.00
101222223	06/06/96	06/01/96	2	1	BED FRAME- KING, QUEEN	\$4.90	
101222223	06/06/96	06/01/96	3	1	BLUE DAMASK QUEEN MATTRESS	\$17.20	
101222223	06/06/96	06/01/96	4	1	BLUE DAMASK QUEEN BOXSPRING	\$13.40	
101222223	06/06/96	06/01/96	5	2	FROLIC CHAIR	\$7.02	
101222223	06/06/96	06/01/96	6	2	TARRAGANO NITE STAND	\$9.60	
101222223	06/06/96	06/01/96	7	1	BERLIN IVORY DINING TABLE	\$13.50	
101222223	06/06/96	06/01/96	8	1	LAMP- ALMOND	\$5.95	
101222223	06/06/96	06/01/96	9	0	Damage Protection	\$7.06	\$95.25
101222223	06/06/96	06/01/96	10	0	Distribution fee	\$0.00	\$40.00
2393557582	06/06/96	06/01/96	1	0	Rental- 9 items, 06/01/96 to 07/01/96	\$0.00	\$0.00
2393557582	06/06/96	06/01/96	2	1	BED FRAME- KING, QUEEN	\$4.90	
2393557582	06/06/96	06/01/96	3	1	BLUE DAMASK QUEEN MATTRESS	\$17.20	
2393557582	06/06/96	06/01/96	4	1	BLUE DAMASK QUEEN BOXSPRING	\$13.40	

95000.952

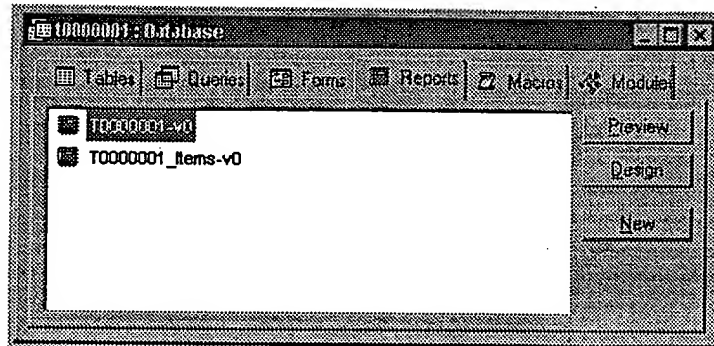
Appendix 1

Express Mail #EM300602468US

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2393557582	06/06/96	06/01/96	5	2	FROLIC CHAIR	\$7.02	
2393557582	06/06/96	06/01/96	6	2	TARRAGANO NITE STAND	\$9.60	
2393557582	06/06/96	06/01/96	7	1	BERLIN IVORY DINING TABLE	\$13.50	
2393557582	06/06/96	06/01/96	8	1	LAMP- ALMOND	\$5.95	
2393557582	06/06/96	06/01/96	9	0	Damage Protection	\$7.06	\$95.25
2393557582	06/06/96	06/01/96	10	0	Distribution fee	\$0.00	\$40.00

2. The Reports



USPTO60028095.100996

a. T0000001-v1

Page Header	
BROOK FURNITURE RENTAL, INC. HOME & OFFICE P.O. BOX 100515 PASADENA, CA 91189-0515	
Account Number	Due Date
Format([Amount Due], "0000000000") & "000000000000000000"	
Account Number	
Customer Name	
Customer Address 1	
FOR CHANGE OF ADDRESS INDICATE HERE AND SEE REVERSE SIDE PLEASE DETACH HERE TO RETURN TO US FOR PAYMENT, IF PAYING IN PERSON, BRING STATEMENT.	
CALLING QUESTIONS? CALL FOR OTHER QUESTIONS, CALL SEE BACK FOR IMPORTANT	
Account Number	Questions Phone
Other Phone	Due Date

Data	
T0000001_Items-v0	
 BROOK FURNITURE RENTAL HOME & OFFICE	
Invoice Date	Amount Due

Private Sub Detail_Format(Cancel As Integer, FormatCount As Integer)

Me!Paid_in_Full.Visible = (Me!Paid)

End Sub

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343-8441 764 N 7 159					Surcharge					
415 343-8441 764 N 7 159	06/02/96	7	Taxes	6	State Regulator y Fee	0			\$0.05	0
415 343-8441 764 N 7 159	06/02/96	8	Taxes	7	CA Relay Service and Comunica tions Devices Fund	0			\$0.17	0
415 343-8441 764 N 7 159	06/02/96	9	Taxes	8	Tax: Fed: .45 911: .08 Local:				\$0.53	0
415 343-8441 764 N 7 159	06/02/96	10	Taxes	0		0			\$4.99	-1
415 343-8441 764 N 7 159	06/02/96	11	Instal lment Billin g	0	Service Connectio n Residence Service Flat Rate	1	\$0.00	\$0.00	\$34.75	0
415 343-8441 764 N 7 159	06/02/96	12	Instal lment Billin g	0	Total Charges Applied to your Installme nt Plan	0	\$0.00	\$0.00	\$34.75	-1
415 343-8441 764 N 7 159	06/02/96	13	Instal lment Billin g	0	Your Charges Will Be Billed in 3 Installme nts	-1	\$0.00	\$0.00	\$0.00	0
415 343-8441	06/02/96	14	Instal lment	9	Installati on Payment	0	\$0.00	\$11.58	\$11.58	0

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764 N 7 159					Due 1 fo 3					
415 343- 8441 764 N 7 159	06/02/96	15	Instal lment	0		0	\$0.00	\$11.5 8	\$11.58	-1
415 343- 8441 764 N 7 159	06/02/96	16	Total	10	Access for Intersate Calling 3.50 Per Month	1	\$0.00	\$0.00	\$0.00	0
415 343- 8441 764 N 7 159	06/02/96	17	Total	11	Residence Service Flat Rate 11.25 Per Month	1	\$0.00	\$0.00	\$0.00	0
415 343- 8441 764 N 7 159	06/02/96	18	Total	0		0	\$0.00	\$0.00	\$0.00	-1
415 343- 8441 764 N 7 159	06/02/96	19	Total	0	Total for 415 343- 1234	0	\$0.00	\$11.5 8	\$11.58	-1

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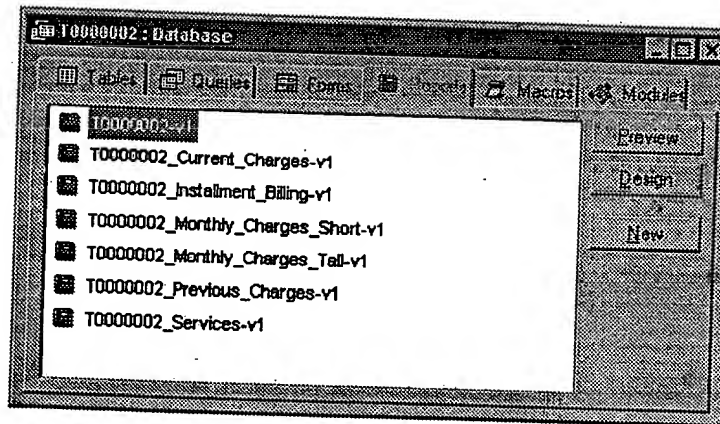
e. T0000002_Previours_Charges-v1

Account Number	Statement Date	Item Number	Description	Amount	Is Total
415 343-8441 764 N 7 159	06/02/96	1	Amount of last bill	\$0.00	0
415 343-8441 764 N 7 159	06/02/96	2	Payment(s)	\$0.00	0
415 343-8441 764 N 7 159	06/02/96	3	Balance	\$0.00	-1

f. T0000002_Services-v1

Account Number	Statement Date	Group	Item Number	Description	Is Total
415 343-8441 764 N 7 159	06/02/96	1	1	• We Are Not Holding a Deposit on Your Account.	0
415 343-8441 764 N 7 159	06/02/96	1	2	• Service is Billed in Advance from the 2nd of Each Month.	0
415 343-8441 764 N 7 159	06/02/96	1	3	• Easy Access established with MCI on 1 line(s) effective Jun 1, 1996. To verify your carrier, call 1-700-555-4141.	0
415 343-8441 764 N 7 159	06/02/96	1	4	• Activity on 415 343-1234	-1
415 343-8441 764 N 7 159	06/02/96	1	5	• Order 45417777	0
415 343-8441 764 N 7 159	06/02/96	1	6	• Installment Billing Effective on Jun 1, 1996	0
415 343-8441 764 N 7 159	06/02/96	2	7	• Service Established from Jun 1, 1996 thru Jun 1, 1996	0

2. The Reports



a. T0000002-v1

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PACIFIC BELL A Pacific Telecable Company			
Two-sided form saves paper!			
Residence Service Flat Rate	Statement Date	Customer Name	Page # & [Page]
Account Number	Statement Date	Unbound	
Account Number		Unbound	
		Unbound	
		Unbound	
Page Header			
PACIFIC BELL A Pacific Telecable Company			
Two-sided form saves paper!			
Account Number	Statement Date	Page # & [Page]	
Account Number	Statement Date		
Questions about your Pacific Bell bill? 800-310-2355			
Data			
Charges	T0000002_Previous_Charges-v1		
Current Charges	T0000002_Current_Charges-v1		
Total Due	Due by * & [Due Date]		
LATE CHARGE REMINDER: A late charge may be applied on If your payment has not been received. Your bill, however, must still be paid before the DUE BY date to avoid other penalties (See Reverse)			
Whom to Call	Pacific Bell - Customer service: 800-310-BELL or 800-310-2355		
	Automatic Payment Service-To apply for this service call: 800-794-9794		
	Pay-by-Phone - To use or apply for this service, call: 800-794-9794		
	Centro Hispano de Pacific Bell, llame gratis: 800-870-5355		
Two Free Services from Pacific Bell	Pacific Bell has two services that make it more convenient to pay your telephone bill, Automatic Payment Service or Pay-By-Phone. With Automatic Payment Service your bill is paid automatically each month. Pay-By-Phone makes paying your bill as easy as a phone call. Best of all both services are free. For more information or to apply for these services call 1-800-794-9794.		

note page separator here ...

Pacific Bell Monthly Charges	
T0000002_Monthly_Charges_Tail-v1	
T0000002_Monthly_Charges_Tail-v1	
Total Pacific Bell Monthly Charges	
Additions and Changes to Pacific Bell Service(s)	
T0000002_Services-v1	
T0000002_Installment_Billing-v1	
T0000002_Monthly_Charges_Short-v1	
T0000002_Services-v1	
T0000002_Monthly_Charges_Short-v1	
Total Additions and Changes to Pacific Bell Services	
Changes to Service	

Private Sub Detail_Format(Cancel As Integer, FormatCount As Integer)

```

lblTotal_Due.Caption = Space(50) _
    & "A late charge may be applied on " _
    & Format(Me!Late_Date, "mmmm d")
lblTotal_Due.Caption = lblTotal_Due.Caption _
    & " if your payment has not been received. " _
    & "Your bill, however, must still be paid before " _
    & " the DUE BY date to avoid other penalties " _
    & "(See Reverse)"

```

End Sub

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Private Sub ReportHeader_Format (Cancel As Integer, FormatCount As Integer)

Dim sAddress(1 To 4) As String

sAddress(1) = Me!Customer_Address_1
sAddress(2) = Me!Customer_Address_2
sAddress(3) = Me!Customer_Address_3
sAddress(4) = Me!Customer_Address_4

If Len(sAddress(1)) = 0 Then
sAddress(1) = sAddress(2)
sAddress(2) = sAddress(3)
sAddress(3) = sAddress(4)
sAddress(4) = ""

End If

If Len(sAddress(2)) = 0 Then
sAddress(2) = sAddress(3)
sAddress(3) = sAddress(4)
sAddress(4) = ""

End If

If Len(sAddress(3)) = 0 Then
sAddress(3) = sAddress(4)
sAddress(4) = ""

End If

Me!txtAddress_1 = sAddress(1)
Me!txtAddress_2 = sAddress(2)
Me!txtAddress_3 = sAddress(3)
Me!txtAddress_4 = sAddress(4)

End Sub

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b. T0000002_Current_Charges-v1

Detail		
Description	lblPage_Number	Amount
Pacific Bell	Page 2	\$27.82
		\$27.82

Note that all of these fields have .Top=.04", and that they are spread out for clarity only.

Private Sub Detail_Format (Cancel As Integer, FormatCount As Integer)

'Line_Before ...

If Me!Item_Number = 1 Then
Line_Before.Visible = False
Description.FontWeight = 400 'normal
lblPage_Number.FontWeight = 400

```

        Amount.FontWeight = 400
    Else
        Line_Before.Visible = True
        If Me!Is_Total Then
            Line_Before.BorderWidth = 3
            Description.FontWeight = 700 'bold
            lblPage_Number.FontWeight = 700
            Amount.FontWeight = 700
        Else
            Line_Before.BorderWidth = 1
            Description.FontWeight = 400 'normal
            lblPage_Number.FontWeight = 400
            Amount.FontWeight = 400
        End If
    End If
End If

'lblPage_Number ...
If Me!Page_Number = 0 Then
    lblPage_Number.Visible = False
Else
    lblPage_Number.Visible = True
    lblPage_Number.Caption = "Page " & Me!Page_Number
End If

End Sub

```

c. T0000002_Installment_Billing-v1

Charges Included in your Installment Plan				
Quantity	Description	Amount	Total	
1	Service Correction	34.75		
	Residence Service Fld Rate			
Total Charges Applied to your Installment Plan		34.75		
Your Charges Will Be Billed in 3 Installments				

Dim miLine_Count

As Integer

```

Private Sub Detail_Format(Cancel As Integer, FormatCount As Integer)

```

```

    miLine_Count = miLine_Count + 1
    'Line_Before ...
    If Me!Is_Total Then
        Line_Before.BorderWidth = 3
        Description.FontWeight = 700 'bold
        Amount.FontWeight = 700
    Else
        Line_Before.BorderWidth = 1
        Description.FontWeight = 400 'normal
        Amount.FontWeight = 400
    End If

```

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```

Line_Number ...
  If Quantity <= 0 Then
    Description.Left = 1 * 1440
    Quantity.Visible = False
  Else
    Description.Left = 1.75 * 1440
    Quantity.Visible = True
  End If

  Select Case True
    Case (Quantity = 0 And Len(Description) > 0) Or mLine_Count = 1
      Line_Before.Visible = True
      Line_Before.Width = 0.5
      Line_Before.Left = 1 * 1440
      Line_Before.Width = 6 * 1440
    Case Quantity = -1
      Line_Before.Visible = False
    Case Else
      Line_Before.Visible = True
      Line_Before.Left = 0
      Line_Before.Width = 5.25 * 1440
      Line_Before.Left = 1.75 * 1440
    End Select
  End Sub

```

d. T0000002_Monthly_Charges_Short-v1

T0000002_Monthly_Charges_Short-v1				
Description	Qty	Pro-Rated	One-Time	Amount
Line Number	Quantity	Pro-Rated	One-Time	Amount
Description				

Note that all of these fields have .Top=0.04", and that they are spread out for clarity only.

Description	Qty	Pro-Rated	One-Time	As
1. Residence Service Flat Rate	1			
Monthly Service Jun 2, 1996 thru Jul 1, 1996				
Description	Qty	Pro-Rated	One-Time	As
9. Installation Payment Due 1 to 3			11.58	
			11.58	
Description	Qty	Pro-Rated	One-Time	As
Service Connection				
Residence Service Flat Rate	1			
Total Charges Applied to your Installment Plan				
Your Charges Will Be Billed In 3 Installments				
Description	Qty	Pro-Rated	One-Time	As
2. Charges for Network Access for Interstate Calling, Imposed by Federal Communications Commission				
3. California High Cost Fund Surcharge				
4. Universal Lifeline Telephone Service Surcharge				
5. Rate Surcharge				
6. State Regulatory Fee				
7. CA Relay Service and Communications Devices Fund				
8. Tax: Fed .45 911: .08 Local:				
Description	Qty	Pro-Rated	One-Time	As
10. Access for Interstate Calling 3.50 Per Month	1			
11. Residence Service Flat Rate 11.25 Per Month	1			
Total for 415 343-4234				11.58

Dim miLine_Count

As Integer

Private Sub Detail_Format (Cancel As Integer, FormatCount As Integer)

miLine_Count = miLine_Count + 1

'Line_Before ...

If Me!Is_Total Then

Line_Before.BorderWidth = 3

Description.FontWeight = 700 'bold

Amount.FontWeight = 700

Else

Line_Before.BorderWidth = 1

Description.FontWeight = 400 'normal

Amount.FontWeight = 400

End If

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```

'Line_Number ...
  If Line_Number = 0 Then
    Description.Left = 0.5 * 1440
    Line_Number.Visible = False
  Else
    Description.Left = 1 * 1440
    Line_Number.Visible = True
  End If

  If (Line_Number = 0 And Len(Description) > 0) Or miLine_Count = 1
    Line_Before.Width = 0.5
    Line_Before.Left = 0.5 * 1440
    Line_Before.Width = 6.5 * 1440
  Else
    Line_Before.Left = 0
    Line_Before.Width = 6.15 * 1440
    Line_Before.Left = 0.85 * 1440
  End If

'Quantity...
  If IsNull(Quantity) Then
    Quantity.Visible = False
  Else
    Quantity.Visible = (Quantity > 0)
  End If

'lblAmount_CR..
  lblAmount_CR.Visible = (Amount < 0)

End Sub

Private Sub GroupHeader0_Format(Cancel As Integer,
                                FormatCount As Integer)
  Select Case Me!Type
    Case "Basic":
      lblQuantity.Visible = True
      lblPro_Rated.Visible = False
      Pro_Rated.Visible = False
      lblOne_Time.Visible = False
      One_Time.Visible = False

    Case "Taxes":
      lblQuantity.Visible = False
      lblPro_Rated.Visible = False
      Pro_Rated.Visible = False
      lblOne_Time.Visible = False
      One_Time.Visible = False

    Case Else:
      lblQuantity.Visible = True
      lblPro_Rated.Visible = True
      Pro_Rated.Visible = True
      lblOne_Time.Visible = True
      One_Time.Visible = True

  End Select

  miLine_Count = 0
End Sub

```

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e. T0000002_Monthly_Charges_Tail-v1

Line Header				
Service				
Description	Qty	Pro-Rated	One-Time	Amount
Installation	Quantity	Pro-Rated	One-Time	Amount

* Basic Service

Description	Qty	Amount
1. Residence Service Flat Rate	1	
Monthly Service Jun 2, 1996 thru Jul 1, 1996		

Description	Qty	Pro-Rated	One-Time	Amount
9. Installation Payment Due 1 to 3				11.58
				11.58

Description	Qty	Pro-Rated	One-Time	Amount
Service Connection	1			
Residence Service Flat Rate				
Total Charges Applied to your Installment Plan				
Your Charges Will Be Billed in 3 Installments				

* Taxes and Surcharges

Description	Amount
2. Charges for Network Access for Interstate Calling, Imposed by Federal Communications Commission	
3. California High Cost Fund Surcharge	
4. Universal Lifeline Telephone Service Surcharge	
5. Rate Surcharge	
6. State Regulatory Fee	
7. CA Relay Service and Communications Devices Fund	
8. Tax Fed .45 911: .08 Local:	

Dim miLine_Count As Integer

Private Sub Detail_Format(Cancel As Integer, FormatCount As Integer)

miLine_Count = miLine_Count + 1

'Line_Before ...

If Me!Is_Total Then

Line_Before.BorderWidth = 3

Description.FontWeight = 700 'bold

Amount.FontWeight = 700

Else

Line_Before.BorderWidth = 1

Description.FontWeight = 400 'normal

Amount.FontWeight = 400

```

End If

'Line_Number ...
If Line_Number = 0 Then
    Description.Left = 0.5 * 1440
    Line_Number.Visible = False
Else
    Description.Left = 1 * 1440
    Line_Number.Visible = True
End If

If (Line_Number = 0 And Len(Description) > 0) Or miLine_Count = 1
    Line_Before.Width = 0.5
    Line_Before.Left = 0.5 * 1440
    Line_Before.Width = 6.5 * 1440
Else
    Line_Before.Left = 0
    Line_Before.Width = 6.15 * 1440
    Line_Before.Left = 0.85 * 1440
End If

'Quantity...
If IsNull(Quantity) Then
    Quantity.Visible = False
Else
    Quantity.Visible = (Quantity > 0)
End If

'lblAmount_CR..
lblAmount_CR.Visible = (Amount < 0)

End Sub

Private Sub GroupHeader0_Format(Cancel As Integer, FormatCount As Integer)

    Select Case Me!Type
    Case "Basic":
        lblService.Caption = "** Basic Service"
        lblQuantity.Visible = True
        lblPro_Rated.Visible = False
        Pro_Rated.Visible = False
        lblOne_Time.Visible = False
        One_Time.Visible = False

    Case "Taxes":
        lblService.Caption = "** Taxes and Surcharges"
        lblQuantity.Visible = False
        lblPro_Rated.Visible = False
        Pro_Rated.Visible = False
        lblOne_Time.Visible = False
        One_Time.Visible = False

    Case Else:
        lblService.Caption = ""
        lblQuantity.Visible = True
    
```

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```

        lblPro_Rated.Visible = True
        Pro_Rated.Visible = True
        lblOne_Time.Visible = True
        One_Time.Visible = True

    End Select

    miLine_Count = 0

End Sub

```

f. T0000002_Previous_Charges-v1

Detail	
Description	Amount
Amount of last bill	\$0.00
Payment(s)	\$0.00
Balance	\$0.00

```
Private Sub Detail_Format(Cancel As Integer, FormatCount As Integer)
```

```

    If Me!Item_Number = 1 Then
        Line_Before.Visible = False
        Description.FontWeight = 400 'normal
        Amount.FontWeight = 400
    Else
        Line_Before.Visible = True
        If Me!Is_Total Then
            Line_Before.BorderWidth = 3
            Description.FontWeight = 700 'bold
            Amount.FontWeight = 700
        Else
            Line_Before.BorderWidth = 1
            Description.FontWeight = 400 'normal
            Amount.FontWeight = 400
        End If
    End If
End Sub

```

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g. T0000002_Services-v1

Description
<ul style="list-style-type: none"> • We Are Not Holding a Deposit on Your Account. • Service is Billed In Advance from the 2nd of Each Month. • Easy Access established with MCI on 1 line(s) effective Jun 1, 1996. To verify your carrier, call 1-700-555-4141. • Activity on 415 343-1234 • Order 45417777 • Installment Billing Effective on Jun 1, 1996 • Service Established from Jun 1, 1996 thru Jun 1, 1996

Private Sub Detail_Format (Cancel As Integer, FormatCount As Integer)

Select Case Is_Total

Case True: Description.FontWeight = 700 'bold

Case Else: Description.FontWeight = 400 'normal

End Select

End Sub

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Appendix G - ESP System Data Flow Projections

An Excel spreadsheet model was developed to quantify estimates of data flow through the ESP system. Two scenarios are of particular interest: one corresponding to the pilot program scheduled for early 1997 and one corresponding to a mature system. The pilot scale results are of immediate interest to enable us to begin ordering the hardware needed for development and deployment. The mature system results are of special interest because we need to be able to verify that the system architecture is easily scaleable.

A. Assumptions

Input data affecting results is shown in *Figure 2626 - System Input Volumes* and *Figure 2727 - Common Parameters* below. *Figure 2626* contains assumptions that varied between cases while *Figure 2727* shows assumptions common to the two cases.

Input Quantity	Pilot System	Mature System
Participant Counts		
Statement Originators	20	10,000
Originators, This SSP	4	2,500
CSPs	2	100
Customers	2,000	2,500,000
Customers, This CSP	1,000	250,000
Template Data		
Templates Per Originator	1.0	2.0
Monthly Template Update Size (kb)	500	300
Tries per Update Success	4	2
Global Template Fraction	100%	40%
Statement Data		
Statements Per Originator-Month	500	2,000
Statement Content Size (kb)	2.5	10
Statement Component Counts		
Mandatory Generic Enclosures	1	1.5
Optional Generic Enclosures	5	10
Statement Optional Component Take Rates		
Personalized Originator Buy-In	10%	25%
Personalized Customer Take Rate	75%	40%
Generic Take Rate	25%	10%

Figure 26 - System Input Volumes

Common Parameters	Both Systems
Statement Component Sizes (kb)	
BSP Interactive Page	40
Mandatory Personalized (Access-based)	40
Optional Personalized (Access-based)	60
Mandatory Generic	15
Optional Generic	60
Communications Efficiencies	
Orig to SSP	85%
SSP to SOrig WS	98%
SOrig WS to eSwitch	90%
eSwitch to SGen WS	90%
SGen WS to CSP	98%
CSP to Customer	85%

Figure 27 - Common Parameters

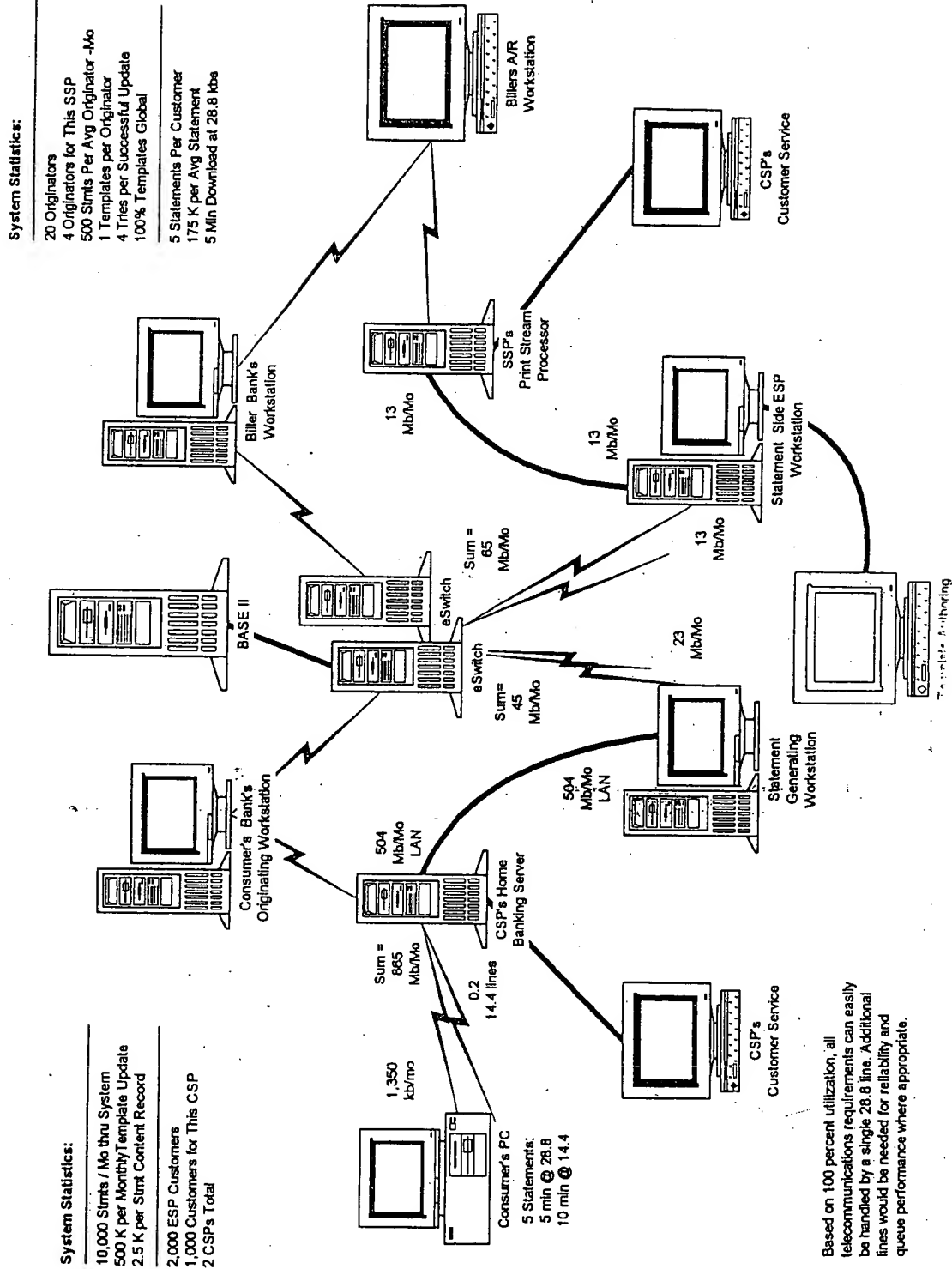
B. Results

Following are two sets of results, seven pages each set, for the Kansas City Pilot and a Mature System. Each set begins with a network diagram summarizing data flow results, then a table of input data for the case, and finally five pages of detailed output. The calculations are described in the section following.

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ESP System Data Flow Model Diagram Kansas City Pilot, Revision 2

96600T-560820090145N



Based on 100 percent utilization, all telecommunications requirements can easily be handled by a single 28.8 line. Additional lines would be needed for reliability and queue performance where appropriate.

ePay System Flow Scenario:
Kansas City Pilot, Revision 2

OUTPUT

Statement Side Workstation Monthly Flows

Aggregate Incoming/Share	Count	Mb
<u>From SSPs</u>		
Template Updates	16	8.0
Content Recds	2,000	5.0
Admin Msgs		
Total:		13.0

<u>Aggregate Outgoing</u>		
<u>To eSwitch:</u>		
Template Updates	16	8.0
Content Recds	2,000	5.0
Admin Msgs		
Total:		13.0

<u>Lines Required (100% Utilization)</u>			
<u>From SSP:</u>	1,544	128	57.6
Eff: 98%	0.0	0.0	0.0
<u>To eSwitch:</u>	1,544	128	57.6
Eff: 90%	0.0	0.0	0.0

Name	kbits/sec	\$/Mo
100Mbs	100,000	LAN
T3	44,184	70,000
16Mbs	16,000	LAN
10Mbs	10,000	LAN
T1	1,544	2,000
ISDN	128	100
56K	58	150
28.8	28.8	30
14.4	14.4	30
9.6	9.6	30

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eSwitch Monthly Flows

Aggregate Incoming	Count	Mb
Template Updates	80	40
Content Recds	10,000	25
Admin Msgs		
Total:		65

Aggregate to Storage		
Template Updates	20	10
Content Recds	10,000	25
Admin Msgs		
Total:		35

Aggregate Outgoing		
Template Updates	40	20
Content Recds	10,000	25
Admin Msgs		
Total:		45

Lines Required (100% Utilization)

<u>From SSWS:</u>	128	57.6	28.8
Eff: 90%	0.0	0.0	0.0
<u>To SGWS:</u>	128	57.6	28.8
Eff: 90%	0.0	0.0	0.0

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Statement Generation Workstation Monthly Flows

Aggregate Incoming	Count	Mb
<u>From eSwitch</u>		
Template Updates	20	10
Content Recds	5,000	13
Admin Msgs		
<u>From CSP</u>		
Admin Msgs		
Total:		23

PDFs Per 1000 Statements		
BSP Interactive	1,000	40
Acc Req'd, C-Spec	1,000	40
Acc Optional, C-Spe	100	6
Req'd, Generic	1	0
Optional, Generic	5	0
Total:		86

Aggregate Outgoing / Share		
<u>To CSP</u>		
Initial PDFs	5,000	475
C-Spec Opt PDFs	500	20
Generic Opt PDFs	100	9
Admin Msgs		
<u>To eSwitch:</u>		
Admin Msgs		
Total:		504

Lines Required (100% Utilization)			
<u>From eSwitch</u>	1,544	128	57.6
Eff: 90%	0.0	0.0	0.0
<u>To CSP</u>	1,544	128	57.6
Eff: 98%	0.0	0.0	0.0

USPTO60028095.100996

CSP Home Banking Software Monthly Flows

Aggregate Incoming / Share

	Count	Mb
<u>From Stmt Gen WS</u>		
Initial PDFs	5,000	475
C-Spec Opt PDFs	500	20
Generic Opt PDFs	100	9
Admin Msgs		
Total:		504

Aggregate Outgoing / Share

<u>To Customers</u>		
Initial PDFs	5,000	475
C-Spec Opt PDFs	375	15
Generic Opt PDFs	6,250	375
Admin Msgs		
<u>To Stmt Gen WS</u>		
Admin Msgs		
Total:		865

Lines Required (100% Utilization)

<u>From SGWS</u>	1,544	128	57.6
Eff: 98%	0.0	0.0	0.0
<u>To Customers</u>	28.8	14.4	9.6
Net cps	3,060	1,530	1,020
Eff: 85%	0.1	0.2	0.3

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Home Banking Software User Monthly Flows

Statements 5.0

Incoming PDF Traffic (Expected)

	Per Stmt	kb	All Stmts	kb
Initial PDFs	1.0	95	5.0	475
C-Spec Opt PDFs	0.1	5	0.4	23
Generic Opt PDFs	1.3	75	6.3	375
Total:	2.3	175	11.6	873

Download Times (All Statements)

Eff:	Modem	57.6	28.8	14.4	9.6
85%	Net cps	6,120	3,060	1,530	1,020
	Seconds	143	285	570	855
	Minutes	2.4	4.8	9.5	14.3

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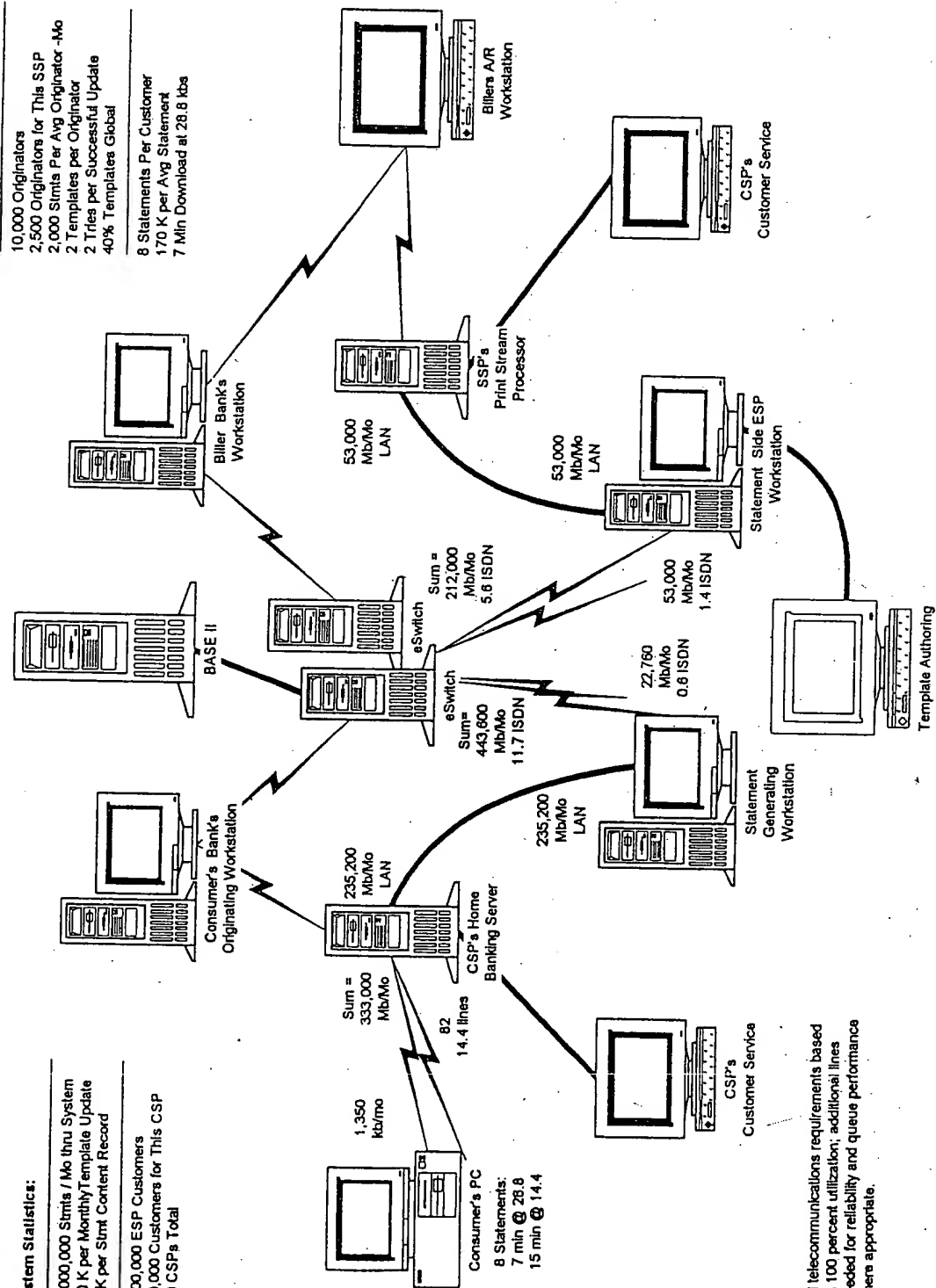
USP TO 602 (9) 5. 100995

System Statistics:

20,000,000 Struts / Mo thru System
300 K per Monthly Template Update
10 K per Strut Content Record

2,500,000 ESP Customers
250,000 Customers for This CSP
100 CSPs Total

10,000 Originators
2,500 Originators for This SSP
2,000 Limits Per Avg Originator-Mo
2 Templates per Originator
2 Tries per Successful Update
40% Templates Global
8 Statements Per Customer
170 K per Avg Statement
7 Min Download at 28.8 kbs



All telecommunications requirements based on 100 percent utilization; additional lines needed for reliability and queue performance where appropriate.

ePay System Data Flow Model

Mature System, Rev 2

INPUT	Description	Variable Name	Base
Participant Counts			
	Originator Count	CntOriginator	10,000
	Originator Count, This SSP	CntOrigSSP	2,500
	CSP Count	CntCSP	100
	Customer Count, Total	CntCustTotal	2,500,000
	Customer Count, This CSP	CntCustCSP	250,000
Template Data			
	Templates Per Originator	TemplPerOrig	2.0
	Monthly Template Update Size (kb)	TemplUpdSize	300
	Tries Per Update Success	TemplUpdTries	2.0
	Fraction Global Templates	TemplGlobalFrac	40%
Statement Data			
	Statements Per Originator Per Month	StmntPerOrigMo	2,000
	Statement Content Size (kb)	StmntContentSize	10
PDF Data			
<u>Sizes</u>			
	BSP Interactive Size (kb)	PDFBSPIntSize	40
	Access Req'd, C-Spec Size (kb)	PDFReqdCSpecSize	40
	Access Optional, C-Spec Size (kb)	PDFOptCSpecSize	60
	Req'd, Generic Size (kb)	PDFReqdGenSize	15
	Optional, Generic Size (kb)	PDFOptGenSize	60
<u>Counts</u>			
	Req'd, Generic, Count	PDFReqdGenCount	1.5
	Optional, Generic, Count	PDFOptGenCount	10
<u>Take Rates</u>			
	Access Optional, C-Spec Buy-In	PDFOptCSpecBuyIn	25%
	Access Optional, C-Spec Take Rate	PDFOptCSpecTake	40%
	Optional, Generic, Take Rate	PDFOptGenTake	10%
Communications Efficiencies			
	Orig to SSP	CommEffOrigToSSP	85%
	SSP to SSWS	CommEffSSPToSSWS	98%
	SSWS to eSwitch	CommEffSSWSToeSwitch	90%
	eSwitch to SGWS	CommEffSwitchToSGWS	90%
	SGWS to CSP	CommEffSGWSToCSP	98%
	CSP to Customer	CommEffCSPToCust	85%
Constants			
	Mb/Mo per k-bits/sec	Conv	

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ePay System Flow Scenario:
Mature System, Rev 2

OUTPUT

Statement Side Workstation Monthly Flows

	Count	Mb
Aggregate Incoming/Share		
<u>From SSPs</u>		
Template Updates	10,000	3,000
Content Recds	5,000,000	50,000
Admin Msgs		
Total:		53,000

Aggregate Outgoing		
<u>To eSwitch:</u>		
Template Updates	10,000	3,000
Content Recds.	5,000,000	50,000
Admin Msgs		
Total:		53,000

Lines Required (100% Utilization)

<u>From SSP:</u>	1,544	128	57.6
Eff: 98%	0.1	1.3	2.9
<u>To eSwitch:</u>	1,544	128	57.6
Eff: 90%	0.1	1.4	3.1

Name	kbits/sec	\$/Mo
100Mbps	100,000	LAN
T3	44,184	70,000
16Mbps	16,000	LAN
10Mbps	10,000	LAN
T1	1,544	2,000
ISDN	128	100
56K	58	150
28.8	28.8	30
14.4	14.4	30
9.6	9.6	30

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eSwitch Monthly Flows

Aggregate Incoming	Count	Mb
Template Updates	40,000	12,000
Content Recds	20,000,000	200,000
Admin Msgs		
Total:		212,000

Aggregate to Storage		
Template Updates	20,000	6,000
Content Recds	20,000,000	200,000
Admin Msgs		
Total:		206,000

Aggregate Outgoing		
Template Updates	812,000	243,600
Content Recds	20,000,000	200,000
Admin Msgs		
Total:		443,600

Lines Required (100% Utilization)

<u>From SSWS:</u>	1,544	128	57.6
Eff: 90%	0.5	5.6	12.4
<u>To SGWS:</u>	1,544	128	57.6
Eff: 90%	1.0	11.7	26.0

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Statement Generation Workstation Monthly Flows

Aggregate Incoming	Count	Mb
<u>From eSwitch</u>		
Template Updates	9,200	2,760
Content Recds	2,000,000	20,000
Admin Msgs		
<u>From CSP</u>		
Admin Msgs		
Total:		22,760

PDFs Per 1000 Statements		
BSP Interactive	1,000	40
Acc Req'd, C-Spec	1,000	40
Acc Optional, C-Spe	250	15
Req'd, Generic	2	0
Optional, Generic	10	1
Total:		96

Aggregate Outgoing: / Share:		
<u>To CSP</u>		
Initial PDFs	2,000,000	205,000
C-Spec Opt PDFs	500,000	20,000
Generic Opt PDFs	92,000	10,179
Admin Msgs		
<u>To eSwitch:</u>		
Admin Msgs		
Total:		235,179

Lines Required (100% Utilization)			
<u>From eSwitch</u>	1,544	128	57.6
Eff: 90%	0.0	0.6	1.3
<u>To CSP</u>	1,544	128	57.6
Eff: 98%	0.5	5.7	12.7

CSP Home Banking Software Monthly Flows

Aggregate Incoming / Share

	Count	Mb
<u>From Stmt Gen WS</u>		
Initial PDFs	2,000,000	205,000
C-Spec Opt PDFs	500,000	20,000
Generic Opt PDFs	92,000	10,179
Admin Msgs		
Total:		235,179

Aggregate Outgoing / Share

<u>To Customers</u>		
Initial PDFs	2,000,000	205,000
C-Spec Opt PDFs	200,000	8,000
Generic Opt PDFs	2,000,000	120,000
Admin Msgs		
<u>To Stmt Gen WS</u>		
Admin Msgs		
Total:		333,000

Lines Required (100% Utilization)

<u>From SGWS</u>	1,544	128	57.6
Eff: 98%	0.5	5.7	12.7
<u>To Customers</u>	28.8	14.4	9.6
Net cps	3,060	1,530	1,020
Eff: 85%	41.3	82.7	124.0

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Home Banking Software User Monthly Flows

Statements 8.0

Incoming PDF Traffic (Expected)

	Per Stmt	kb	All Stmts	kb
Initial PDFs	1.0	103	8.0	820
C-Spec Opt PDFs	0.1	6	0.8	48
Generic Opt PDFs	1.0	60	8.0	480
Total:	2.1	169	16.8	1,348

Download Times (All Statements)

Eff:	Modem	57.6	28.8	14.4	9.6
85%	Net cps	6,120	3,060	1,530	1,020
	Seconds	220	441	881	1,322
	Minutes	3.7	7.3	14.7	22.0

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C. Calculation Methods

This section explains the spreadsheet calculations using the mature case output as an example. Each page of output shows data flows incoming and outgoing from a network node, and shows the number of communication lines required by type.

1. ESP Statement Origination Workstation Monthly Data Flows

Data flows at the *ESP Statement Origination Workstation* are due to *Template* updates and *Statement* content. *Template* updates are expected to consist primarily of changed enclosures and associated distribution logic. Changes to the principal *Statement* document (e.g. the main invoice) are expected to be relatively infrequent.

There are 10,000 *Template* updates per month since there are assumed to be 2,500 originators served by this *SSP*, each of which has an average of 2 *Templates* active¹, and there are assumed to be 2 attempts required per successful registration of a *Template* update ($10,000 = 2,500 * 2 * 2$). This corresponds to 3,000 Mb of *Template* data flow because the size of (compressed) *Template* updates is assumed² to average 300 kb.

There are 5,000,000 content records passed through this Workstation because this *SSP* is assumed to serve 2,500 originators, each of whom produces an average of 2,000 electronic statements per month (which might correspond to a 20 percent ESP share of a 10,000 statement per month biller). Because content records are assumed to be 10 kb each³, this corresponds to 50,000 Mb of content data per month⁴.

Because the spreadsheet does not model administrative message traffic or data flow to and from the authoring workstation, incoming and outgoing data flow are identical. For estimation purposes, it is unlikely that administrative message traffic would exceed 10 percent of the total traffic.

Although it is anticipated that connections between the *ESP Statement Origination Workstation* and the *SSP System* will be by LAN, calculations are shown nevertheless for telecommunications links. A single T1 line

¹ There is some uncertainty about the average number of *Templates* Originators may wish to maintain. Simplicity suggests they maintain just one. On the other hand, multiple *Templates* may prove useful for different classes of *Customers*. e.g. residential vs commercial, high-bandwidth vs. low-bandwidth, etc.

² This assumption of 300 kb per incremental update corresponds to 5 new enclosures per month, most of which would presumably be optional offers. Currently credit card bill typically include 3 new enclosures per month. These new enclosures might be selected via demographic logic from a library of 10 enclosures, some of which changed each month. Alternately, multimedia features could account for large template updates.

³ The assumption of 10 kb of content data per *Statement* is quite generous for the average statement. Fixed format *Statements* like typical utility bills have less than 500 bytes of *Customer*-variable content data per *Statement*. On the other hand, telephone bills can contain a large amount of variable data. The ability to provide optional personalized detail may actually provide incentives for *Originators* increase *Statement* content since only those who want it will get it.

⁴ For purposes of comparison, consider that one of the largest *Statement Services Providers* (SSPs) now in operation received about 2 Gb/hour or about 1,500,000 Mb/month of print stream data. If this *Provider* were to convert 20 percent of his present volume to ESP, the resulting operations would be about 6 times larger than the current example.

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operating between 2 and 3 hours per day could transmit the required data from the *Statement Origination Workstation* to the *ePay Switch*. Alternately, two ISDN dial-up lines operating at about 75 percent of continuous capacity could accomplish the same transfer.

2. *ePay Switch* Monthly Data Flows

Since the *SSP* in this case is assumed to service 25 percent of all *Statement Originators*, it follows that the *ePay Switch's* aggregate incoming flow is four times the *Statement Origination Workstation* outflow.

New incremental storage⁵ at the *ePay Switch* is approximately the same as incoming flow, the only difference being rejected *Template* updates. Active disk-based storage will increase by about 7.5 Gb per month, less deletions. Modular high capacity disk storage systems are available that can be incremented in 54 Gb blocks. Archival storage of content data via CD-ROM will be at the rate of 200 Gb per month, or 40 CDs per day. These CDs will be available for screened statistics and for secure investigations by Visa personnel.

Data flowing from the *ePay Switch* is multiplied by the need to broadcast *Templates* to multiple *CSPs*. The value of the multiplier depends on the weighted coverage fraction of *Templates* in the entire ESP system, called here the *Global Template Fraction*. This fraction is one if every *Template* is distributed to every *CSP*; i.e. if all *Templates* are global. The fraction is zero if every *Template* is used by just one *CSP*; i.e. if all *Templates* are local. Herein, the global *Template* fraction is assumed⁶ to be 40 percent. In the present case, it is assumed that 40 percent of the *Templates* (8,000) are global and hence are sent to all 100 *CSPs*, and that the remaining 60 percent are local and sent to just one *CSP*. Hence 812,000 *Templates* are sent from the *ePay Switch* ($812,000 = 0.4 \times 20,000 \times 100 + 0.6 \times 20,000 \times 1$). The upper bound for the number of *Template* updates sent is 2 million ($100 \times 20,000$) and the lower bound is just 20,000. This translates into 244 Gb per month of *Template* updates flowing from the *ePay Switch*, which is somewhat more than the 200 Gb of content data flowing through the *ePay Switch*⁷.

About 30 ISDN dial-up lines operating at 50 percent capacity would be sufficient to handle both incoming and outgoing traffic. High capacity factors can be achieved because the *ePay Switch* will operate in a polling mode, calling its workstations in sequence as soon as it can process additional data. High volume workstations may profit by using dedicated T1 lines.

⁵ *Statement Content* data is stored at the *ePay Switch* for research purposes. It is likely that only several days of data will be kept on disk, with the remainder being archived to CD-ROM. The bulk of the *ePay Switch's* storage will be for *Templates* and *Template Updates*.

⁶ Although bounded, this fraction is quite uncertain. Twenty percent may be an underestimate. Nominally local *Statements* like those from the Honolulu Water District could be more global than expected. One Sacramento resident and one Vancouver resident might own a vacation home in Hawaii and pay their water bills from their principal residences, making it necessary for their presumably local *CSPs* to keep a copy of the Honolulu Water District template.

⁷ As shown in the equation above, This tendency for *Template* data to exceed *Statement Content* data increases with the number of *CSPs* and the *Global Template Fraction*.

3. ESP Statement Generation Workstation Monthly Data Flows

The CSP in this example is assumed to service 10 percent of all ESP Customers. Accordingly it receives one tenth of all content records, 2,000,000 per month amounting to 20 Gb per month. It also receives 9,200 Templates: 8,000 "global" Templates and 1,200 local Templates, amounting to another 2.7 Gb per month. Total Template storage requirements could reach 30 Gb, depending on the rate at which Template resources are deleted from the system, and on default retirement policies.

Templates and content records are transformed into Mandatory and Optional PDFs at the Statement Generation Workstation. For each 1,000 Statements, the SGWS produces⁸, on average, 1,000 interactive panel PDFs (e.g., containing buttons to retrieve optional enclosures), 1,000 mandatory personalized PDFs, 250 optional personalized PDFs (e.g. invoice detail), 2 mandatory generic PDFs (e.g., regulatory notices), and 10 optional generic PDFs (e.g. promotions). Only 250 optional personalized PDFs are produced by the assumption that only 25 percent of Originators take advantage of this ESP capability. Generic PDFs are few because of their generic nature.

The SGWS for this very large CSP is assumed to deliver 2,000,000 statements per month, and consequently the SGWS shares to the CSPs System 2,000,000 initial PDFs, 500,000 optional personalized PDFs, and 92,000 optional generic PDFs. The first figure is based on one initial PDF per Customer, a 25 percent sign-up rate on the part of Originators for optional personalized statements (e.g details), and 10 Optional Enclosures per Template for 9,200 Templates. The size of the initial PDF is the sum of the interactive PDF, the personalized mandatory PDF, and the expected number of generic mandatory enclosures time their average size. In this case, the initial PDF averages 102.5 kb ($102.5 = 40 + 40 + 1.5 * 15$). Thus the initial PDFs contribute 205 Gb to the SGWS outflow. The 500,000 optional personalized PDF (e.g. statement details) comprise 20 Gb of data. The optional enclosure PDFs comprise another 10 Gb of data per month, bringing the total outflow to 235 Gb per month.

Incoming data could be handled by one ISDN line operating at 60 percent capacity. Data going out to the CSP's Home Banking System should be via network share⁹.

4. CSP Home Banking System Monthly Data Flows

Data flows coming to the large CSP Home Banking System modeled herein are described above. Aggregate outgoing flows are the initial PDFs described previously: 2,000,000 initial PDFs comprising 205 Gb of data, 200,000 optional personalized PDFs (the assumed 40% of the 500,000 prepared by the SGWS) actually requested by Customers amounting to 8 Gb

⁸ Generic PDFs are not actually produced at the Statement Generation Workstation. Mandatory generic PDFs are appended to the mandatory personalized PDF to form the initial PDF. Optional generic PDFs are simply passed along to the CSP's Home Banking Server for delivery on request by individual Customers.

⁹ A standard 10 Mbits/sec Ethernet LAN is about 6 times faster than a T1 line. An Token Ring LAN is about 10 times faster than a T1 line. The still somewhat exotic 100 Mbits/sec Ethernet LAN is about 60 times faster.

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of data, and finally 2,000,000 *Optional Generic Enclosures*¹⁰ requested in the aggregate by all customers which account for an additional 120 Gb of data.

CSP Home Banking System data flows are quite large in this case, roughly 5/6 of the flows through *ePay Switch*. The problems of the CSPs are compounded by the fact that outgoing connections to customers are via slow-speed modem (9.6 to 28.8 kbits/sec capable of between 1000 and 3000 characters per second) and that these connections are *Customer*-initiated. This latter fact requires considerable equipment redundancy to avoid congestion and associated adverse consumer reaction. On a 100 percent utilization basis, the number of outgoing 14.4 kbits/sec lines required to transmit the average of 8 *Statements* to the 250,000 *Customers* assumed to be served by this CSP is 82. To maintain acceptable response during peak periods, it is likely that between two and five times this number of outgoing lines would be required.

5. *CSP Customer Monthly Data Flows*

By assumption, the average *Customer* receives 8 invoices per month, amounting to 1,350 kb. Using 9.6, 14.4, and 28.8 kbits/sec modems at 85 percent transmission efficiency, this implies download times of 22, 15, and 7 minutes for all 8 statements. These estimates do not include a "List of Statements" screen that CSPs will likely prepare as a Table of Contents and navigation tool. The average *Statement* would download completely in less than one minute. Web-based servers that implemented Adobe's ByteServer transmission technology could offer their users considerably more rapid response via the interlaced rendering it supports.

D. Summary of Data Flow Projections

Total flow to and from the *ePay Switch* during pilot will be about 110mB per month. Total flow to and from the *ePay Switch* at maturity will be about 650GB per month. Additional flow results are shown below in Figure 3030 and graphically in Figure 2828 and Figure 2929.

E. Conclusions

The pilot is of such relatively small scale that data flows are easily managed using conventional equipment. Storage requirements are within the capabilities of standard desktop machines. Communications could be accomplished using conventional 28.8 kbits/sec modems. However, to test more realistic production-level equipment and in anticipation of rapid system growth, we plan to test more robust equipment and ISDN communications.

Although one would expect high data flows through the *ePay Switch* at system maturity, the flows through large *CSP Home Banking Systems* are also very large, so large as to suggest the need for architectural improvements prior to commercial release. In particular, it would be desirable to cache as many statement resources as possible at the customer's PC. Resources that might be cached could be entire PDF documents or document building blocks. The more promising approach is to cache the building blocks, such that they could be used in multiple documents. The idea would be to send down a PDF framework that

¹⁰ One optional generic enclosure is expected to be requested since there is assumed to be a 10 percent take rate on the assumed 10 available generic enclosures.

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called for external resources not only for the interactive panel (e.g.: bitmaps for blends, watermarks, logos, and button faces; sound files for opening and closing events), but also for the main document itself. This would entail a fundamental change in the nature of Adobe's PDF format, since currently a PDF document is an integral whole with no provision for references to external resources. After pilot, we expect to work with Adobe to devise ways to reduce data flow between the customer and the home banking System, without compromising the flexibility and control currently provided to *Statement Originators*.

Flow	Pilot System (Mb/Month)	Mature System (Gb/Month)
Single Statement Originating WS to ePay Switch	13	53
ePay Switch from All Statement Originating Workstations	65	212
ePay Switch to All Statement Generation Workstations	45	444
ePay Switch to Single Statement Generation Workstation	23	23
Statement Generation WS to CSP Home Banking System	504	235
CSP Home Banking System to All of CSP's Customers	865	333
CSP Home Banking System to Single Customer	0.875	1.350 mB

Figure 30 - Summary of Data Flow Projections

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PROVISIONAL APPLICATION > FOR PATENT < COVER SHEET



10/09/96

This is a request for filing a PROVISIONAL APPLICATION > FOR PATENT < under 37 CFR 1.53 (b)(2).

Docket Number	95000.952	Type a plus sign (+) inside this box ->	+
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INVENTOR(s)/APPLICANT(s)			
LAST NAME	FIRST NAME	MIDDLE >NAME/< INITIAL	RESIDENCE (CITY AND EITHER STATE OR FOREIGN COUNTRY)
Kolling	Ray		San Mateo, California
Occhino	Michael		Castro Valley, California
Roughgarden	Jeffrey		Redwood City, California
Hayward	James		Shawnigan Lake, Canada

TITLE OF THE INVENTION (280 characters max)			
Electronic Statement Presentation			

CORRESPONDENCE ADDRESS > (including country if not United States) <			
HECKER & HARRIMAN 2029 Century Park East Suite 1600 Los Angeles, California 90067			

ENCLOSED APPLICATION PARTS (check all that apply)			
<input checked="" type="checkbox"/> Specification	Number of Pages	189	<input type="checkbox"/> Small Entity Statement
<input checked="" type="checkbox"/> Drawing(s)	Number of Sheets	25	<input checked="" type="checkbox"/> Other (specify) Return postcard

METHOD OF PAYMENT (check one)			
<input checked="" type="checkbox"/> A check or money order is enclosed to cover the Provisional filing fees			PROVISIONAL FILING FREE AMOUNT (\$)
<input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge filing fees and credit Deposit Account Number:	08-1520		\$150.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE

Date 10 / 9 / 96

TYPED or PRINTED NAME Gary A. Hecker

REGISTRATION NO.
(if appropriate)

31,023

☐ Additional inventors are being named on separately numbered sheets attached hereto

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Application Number <u>8/947,629</u>	Filed <u>10/8/97</u>
Group Art Unit	Examiner

Assistant Commissioner for Patents
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- ☐ (C) an application that claims the benefit of the filing date of an application that is open to public inspection, i.e., Application No. _____, filed _____, or
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In re Application of

Application Number

Filed

60/028,095 Oct. 19

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Paper No. 3

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In re Application of

KOLLING et al

Application Number

60/028095

Filed

OCT 9, 1996

Class Art Unit

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Paper No. *#4*

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☐ (D) an application in which the applicant has filed an authorization to lay open the complete application to the public.

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Signature

Rick Johnson

Typed or printed name

Date

10/18-01

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In re Application of

Application Number

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60/028,095

10-9-96

Paper No. 3

I hereby request access under 37 CFR 1.14(a)(1) to the application file record of the above-identified ABANDONED application, which is identified in, or to which a benefit is claimed, in the following document (as shown in the attachment):

United States Patent Application Publication No. _____, page _____, line _____

United States Patent Number 5,963,925, column _____, line _____, or

WIPO Pub. No. _____, page _____, line _____

Related Information about Access to Pending Applications (37 CFR 1.14):

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Shonda Baden

Signature

Shonda Baden

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